

OCT. 15, 1914

10¢ A COPY

# MOTOR AGE





## Coach Built Electric

**T**HE Rauch & Lang is the only Coach Built Electric—the sole design conforming to high art standards—having harmonious contour—perfected scientific construction.

Ownership means unqualified assurance of service—of prestige—a result of sixty years leadership in coach building. No after regrets.

The Rauch & Lang is Worm Driven—(Top-Mounted—Straight-Type) the first Electric to offer successfully this advanced method of propulsion—Silence—No Adjustments—Longevity.

All the mileage you can use in a day—as fast as the law allows.

*New models now being shipped.*

Dealers in all principal cities will gladly demonstrate. Catalog upon request.

**THE RAUCH & LANG  
CARRIAGE CO.**

2180 W. 25th Street

Cleveland

### BRANCHES:

New York,  
1800 Broadway;  
Minneapolis,  
1207 Harmon Place;  
Kansas City,  
3501 Main Street;  
Cleveland,  
629 Superior Avenue.







## Comfort & Efficiency

is the basis of Scripps-Booth engineering for 1915! For the first time a maximum of engineering thought has been spent to obtain the greatest possible comfort for the passenger! As a result the Scripps-Booth car for 1915 will establish a new standard of road performance for all cars!

"SCRIPPS-BOOTH LUXURY" will express for 1915 a standard by which all other motor vehicles will be judged. This luxury is obtained by the most refined engineering, the most complete equipment, the most expensive and luxurious upholstery and finish that it is possible to obtain.

Dealers now handling the best of the big cars will be interested in obtaining full particulars of this light car now available on request.

**SCRIPPS-BOOTH COMPANY**  
DETROIT





**A Graphite Compound  
made by Experts in the  
Manufacture of Bronze  
Bearings.**



*It carries a perfect  
lubricant—graphite—to  
all parts of the bearing  
surface.*

*It keeps an unbroken  
film of oil on the surface  
of the bearing.*



#### **IMPORTANT**

LESOYL when mixed with any of the standard lubricating oils in the proper proportions is guaranteed to improve the lubrication of

**GEAR BOXES  
DIFFERENTIALS  
PUMPS**

**STEERING GEARS, Etc.**

LESOYL is an invaluable aid to cylinder lubrication for the majority of motors, but before using it we would prefer that you write to make sure that your motor is one which can benefit by the use of LESOYL.

Graphite is a perfect lubricant.

LESOYL contains graphite in exactly the right quantity and in exactly the right degree of fineness.

In itself LESOYL consists of graphite and an ingredient which has a strong capillary affinity for graphite. It is a semi-fluid substance in which the graphite is suspended—not allowed to settle. The virtue of LESOYL does not consist in the graphite alone, but in the way the ingredient with which the graphite is ground suspends and carries the graphite to the surface of the bearings.

LESOYL is not intended for use alone, it is too expensive. It is intended to be mixed with any of the standard lubricating oils on the market to give them the benefit of graphite, thus not only improving the lubricating efficiency of low grade oils but to enable higher grade oils to withstand much higher bearing pressures.

LESOYL is the product of bearing specialists. The nature of our business has compelled us to make a long continued and exhaustive study of lubricating problems.

This is a far more practical angle from which to approach lubricating problems than from the viewpoint of the lubricant manufacturer.

We have perfected a lubricant which we are willing—even anxious—to have used with our bearings—"Lumen." This is our guarantee of faith.

**Lumen Bearing Company**  
**Buffalo** **New York**





# MOTOR AGE



Published by the  
CLASS JOURNAL COMPANY  
910 South Michigan Avenue  
CHICAGO ILLINOIS

## YEARLY SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....\$3.00  
Canada and all Foreign Countries..... 5.00

All currency should be sent by registered mail.

Two weeks should be allowed for change of address to become effective, or for receipt of first copy on a new subscription.

In forwarding change of address, please give old and new address.

BEWARE OF SOLICITORS, OFFERING SUBSCRIPTIONS AT CUT RATES.

Volume XXVI

October 15, 1914

No. 16

## Contents

WHERE THE GREAT HIGH ROAD ENDS.....	5
Description of scenes along route from Vienna to Buda Pesth, as described by J. Inglis Ker, prominent British writer	
BOSTON STAGES INTERESTING DISPLAY OF MOTOR CARS.....	10
Racing also a feature of demonstration at the Hub—Electric show in New York	
EDITORIAL — DEMONSTRATING TRUCKS — EUROPEAN ROADS IN WAR TIME .....	12
AMERICANS CONTINUE TO PROTEST AGAINST TAXATION.....	13
Congress still likely to take up question—Boston continuing fight	
EUROPEAN TRADE SITUATION AS DIAGNOSED BY STURMEY.....	14
Prominent English critic tells of situation in Great Britain—Tells American makers to go slowly — W. F. Bradley touches upon trade outlook in France — Boillot meets with accident driving army car	
COLE FOUR IN OFFICIAL FUEL TEST.....	18
Trials for economy and speed held on big track at Indianapolis	
NATIONAL SHOW ALLOTMENTS ARE MADE.....	19
New York and Chicago each has about 550 exhibitors	
CHERRY CIRCLE WINS FALL INTERCLUB MATCH.....	20
Chicago Automobile Club defeated in 1-day run into Indiana	
MANY COMMERCIAL PROBLEMS DISCUSSED BY TRUCK MEN....	23
Detroit convention of value to the industry — Pertinent topics brought up	
THE CACTUS DERBY, THE COAST'S CLASSIC.....	28
Description of route of Los Angeles-Phoenix road race	
MOTOR CAR DEVELOPMENT.....	36
Description of the Apperson and Carter; the Eisemann magneto	
INDEX TO ADVERTISERS.....	94

## DEPARTMENTS

Routes and Touring Information	30	Coming Motor Events.....	44
Readers' Clearing House.....	32	Among Makers and Dealers....	45
The Accessory Corner.....	42	New Agencies Appointed.....	46
Motor Car Repair Shop.....	43	Brief Business Announcements..	48
From the Four Winds.....	44	Recent Incorporations .....	48

*"Well, Smithson, how do you find business?"*

*"By going out after it!"*

By going out after it and going out after it hard! Getting the jump on competition that has withdrawn its forces from the field to wait till "foreign conditions pick up."

Firing 16-inch advertising guns while the other fellow is oiling up his 22 calibre. Capturing neglected markets rather than going to South America for new ones. Getting in an early bid for a share of that 5-billion dollar crop yield.

That's what Smithson meant!

**MOTOR AGE**  
910 South Michigan Avenue  
CHICAGO



## If You're Going To Buy A Car

Read this voluntary statement from a car owner:

"My experience with the Gray & Davis system has been so satisfactory that it may be a factor in the selection of my next car."

*(Name on request)*

The wise buyer looks well to the starting-lighting system. So much depends upon electric equipment that it becomes the big, vital factor.

When selecting YOUR car, be sure about the system. Remember that over 100,000 motorists are using the highly perfected

# GRAY & DAVIS

## STARTING-LIGHTING SYSTEM

Satisfaction, Service, Safety are easily secured. A powerful, efficient motor and dynamo which meet all starting-lighting requirements under every condition.

*Catalog on Request*

**GRAY & DAVIS, Inc.,**

**Boston, Mass.**

# MOTOR AGE

## Where the Great High Road Ends From Vienna to Buda Pesth by J. Inglis Ker, F.S.A.

*Editor's Note—J. Inglis Ker, a prominent Scotch journalist, was on the Rolls-Royce, which was a contestant in the famous Alpine tour last summer. The route of this tour was through territory where war now is raging, which makes Mr. Ker's description of the country, its roads and its people all the more interesting.*

THE Great High Road of which I write begins on the wind-swept sand dunes of Holland, from which a thriving people have thrust a great stone pier to harbor the ships of the North Sea and welcome the wayfarer to a land of flowers and busy waterways.

### The Road's Course

Beckoning us onwards by sunlit pastures and rich cornfields, through which winds a labyrinth of canals, astir with gaily-colored barges, it carries us over the frontier to Nimegen, an old German town of pathetic interest to all Scotsmen, for here Sir Walter Scott made his last stopping place on that sad return journey to his beloved Abbotsford. By the vine-clad slopes of the romantic Rhine and the falls of Lorelei, through the cathedral towns of Cologne and Coblenz, past time-worn mediaeval castles and white-walled schloss perched above the fragrant vineyards of Rudesheimer and the sunny plains of Frankfurt, it enters the Austrian frontier at Salzburg. Thence across the upper Alps of Austria, and skirting the sombre pine woods of Bohemia, it reaches the green banks of the stately Danube, and soon we find ourselves in the gay city of Vienna. There we embark on the last stage of our journey, leaving behind us the western capital of the empire for the eastern city of Buda Pesth, in the rolling plains of Hungary.

The journey by road from Vienna to Buda Pesth—140 miles—I made recently on a

Rolls Royce in the company of Charles Jarrott, and the impressions which I received during the tour were both numerous

and varied. Of the city of Vienna, one could write at considerable length. Its history goes back to Roman times, when it was an important fortress known as Vindebona, built for the protection of the Romans against the Germanic races. The scholarly Emperor Marcus Aurelius died here in 180 A. D. At a later period—the eighth century—many of the mighty battles of Charlemagne were fought within sight of its ancient walls, but probably its development was due in a large measure to the crusades, which began in 1281, and which in time opened up trade between the east and the west. In the thirteenth century it became the seat of the Hapsburg dynasty, whose fortunes still are the source of anxiety in the councils of Europe.

### Stormed by Turks

In 1529 Vienna was besieged by the Turks, but under the brilliant reigns of Charles VI and the beautiful Maria Theresa it developed rapidly as a great social and political factor. The famous "compromise" or "ausgleich" of 1867 gave it a proud position among the cities of the world, when it became the capital of Austria, its sister city of Buda Pesth being created the capital of the eastern portion of the empire.

Vienna is a modern city, both in its appearance and habits. The cafes and hotels are amongst the finest in Europe, and the boulevards in the afternoons are thronged with gaily-attired, handsome women and Austrian



THE FAMOUS SHELVIO PASS RUNNING FROM SWITZERLAND INTO AUSTRIA



THE JAUFFEN PASS WITH ITS MANY PICTURESQUE TURNS AND STEEP GRADES

officers in gorgeous uniforms. The atmosphere of the city is typically continental and essentially cosmopolitan, and when sunshine floods the gardens along the banks of the Danube, and the strains of a military band fill the summer air, the fair city of Vienna sparkles with life and gaiety. Its boulevards and great open spaces, its parks and fountains and imposing buildings remind one forcibly of Berlin and Paris. The municipal authorities evidently are alive to the needs of the people, their enterprises embracing an up-to-date electric tramway system—single-decked cars, each with two or three trailers—and a gigantic canal and water scheme, while its grain and cattle markets and exchanges rank amongst the foremost in Europe.

#### City of Commercial Importance

The motor car is largely used, and handsome taxicabs are to be had in all the principal thoroughfares. The city's commercial importance is largely due to its situation

at the point where the trading route from the Baltic to the Adriatic crosses the great highway of the Danube, thus facilitating the exchange of commodities between the industrial west and the agricultural east. Its population now is well over 2,000,000 so that it occupies the fourth place amongst the capitals of the old world.

#### A Church 684 Years Old

German is the predominating language and Roman Catholicism the religion of nine-tenths of the people. The center of the city is St. Stephen's platz from which radiates its chief arteries—the Karntner ring, the Graben, and the Totenturn. The academies, palaces, museums, opera house, and university offer some fine examples of modern Gothic architecture, but there is only one building in the city which recalls its ancient history—namely, St. Stephen's kirke. This venerable pile stands in the center of the old market square, and immediately arrests the eye.

Founded on a Romanesque church built in 1147, the present building was begun in 1230, and extended over the various reigns of Rudolph and other Austrian kings as late as 1579, so that the edifice represents many distinctive periods in architectural art. It was in this historic building that the famous congress of Vienna was proceeding when it was learned that Napoleon had escaped from Elba, thus rendering further deliberations useless, for the time being at least. The Rathaus, the Hofburg, the imperial palace of Schonbrunn, with its wondrous gardens and fountains, the Capuchin church containing the tombs of the Hapsburgs, all afford the visitor many opportunities of studying the history and art of the ancient Austrians.

One might dwell at length upon the other attractions of the city, its botanic gardens, its cafes, its prater, and the night festivities of Kaisergar-

ten, but space forbids. A passing reference, however, may be permitted to the palace of the late Archduke Frederick, who met with such a tragic end in Sarajevo a few days after our visit. The palace stands in the Albrecht's platz behind the opera house, in front of which there is a fine marble statue of Mozart, who in his later days made Vienna his home. The palace was begun in 1801, and many extensive alterations were carried out as late as 1867. It contains one of the most remarkable collections of engravings in the world, including many superb examples of Durer, Marc Antonio and Raimondi. The galleries and towers are hung with priceless paintings and works of art.

An early visit of the archduke had been arranged for, and the palace seemed to be undergoing extensive alterations while we inspected it. The news of the archduke's tragic death must have come with startling suddenness to the Viennese, who held the aged emperor's heir in the most loyal affection.

#### The Route to Buda Pesth

The road from Vienna to Buda Pesth follows the sloping banks of the Danube, winding across the great Hungarian plain, from which rise away to the left the vine-clad slopes of the Little Carpathians. It is of excellent width, and for the most part the surface is good, though very dusty in dry weather. Rich cornfields stretch out in every direction, and cherry trees line the road on either side for miles. Twenty miles from Vienna we cross the Leitha river, the boundary between Austria and Hungary, and the principal towns on the route are Pressburg (Pozsony) and Cyör (Raab). The names given in brackets are the Hungarian names, and only these are understood by the natives, whose knowledge of German is limited.

Pressburg is 40 miles from Vienna, and is a typical Hungarian town of considerable antiquity. It was for many years the capital of Hungary, and the historic cathedral was the scene of many coronations of the Hapsburg kings and queens. Cyör, 74 miles from Vienna, overlooks the Danube, and is the center of vast agricultural interests and a great trading ex-



AUSTRIAN SOLDIERS ON THE STREETS OF BUDA-PESTH



change. With the exception of these towns, however, which display not a few evidences of activity and enterprise, the Great Road begins slowly and imperceptibly to offer many striking contrasts to the tourist.

One experiences a subtle, indefinable change. The smiling cornfields and green pasturelands are here, the Danube still flows along in stately silence, the woods are attuned to the music of the birds, the cattle shelter under the trees from the strong sunlight and great bullock wagons lumber along the dusty roads. We search at first in vain for the reason of the change, and at length the human factor supplies it. The Hungarian is of the east. We see no more the "morning face" of which R. L. Stevenson speaks. The smile, the welcome, and the glad hand of the Austrian have gone, the joyousness of the west is behind us. In a land rich in promise we find ourselves amidst a strong, fierce-looking race of men, surly and resentful.

The end of the Great High Road is in sight. The valleys are silent; the villages have a deserted appearance. Dogs stray around and snarl at the wheels of the car. The houses stand with their gable ends to the street, which boast neither pavement nor gutter. Here and there a boy bawls at you, or a forbidding-looking peasant in charge of a team of bullocks blocks the way and shouts imprecations as he gives us grudgingly the right of the road.

#### Nation of Hostile Races

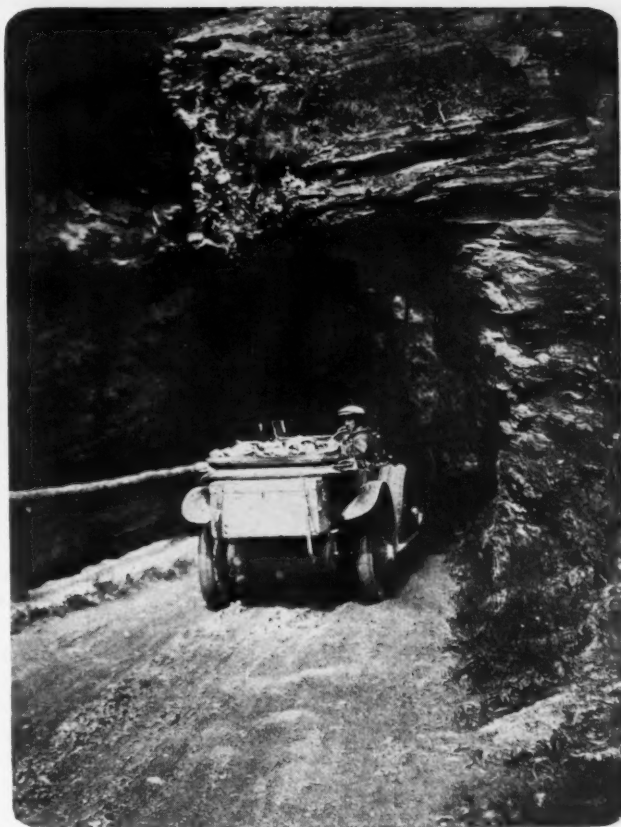
The motor car must travel far before the Hungarian peasant in converted; at present he bristles with resentment. One gradually realizes something of the great gulf between the two races which now own allegiance to one ruler—between the Teuton of Austria and the Slav of Hungary. The difference is only accentuated when one at length reaches the capital. Here the German language is barred. Magyar is the official language, German must not be spoken at the court, on the boulevards, in the cafes, nor in the theaters. By this way the Hungarian strives to preserve his racial traditions, his national independence, his political power and status. In a city of 880,000 population no fewer than 700,000 speak Magyar, and there are other ten

nationalities represented in the remainder.

One marvels at the contrast between Buda Pesth and her sister capital. It is not in the city's appearance. If anything, it is even more striking and modern-looking than Vienna. Built on both sides of the Danube—nearly 600 yards wide—its fine streets and boulevards, its houses of parliament, its royal castle crowning the heights above the river, its cathedral and museums, its network of railways and tramcars, and magnificent parks, all combine to give Buda Pesth a pre-eminent place among the great cities of Europe.

It is in its fine natural surroundings, its imposing streets and finely laid out gardens, as impressive as our own beautiful city of Edinburgh or New York. That is one's first impression of the city when crossing the suspension bridge—built, by the way, by Adam Clark, the distinguished English bridge builder—and the impression becomes a conviction as one at length looks down on the brilliant city from the white facades of the royal palace. But its similarity to other great cities with which we are familiar here ends, for the people themselves introduce a remarkable and vivid contrast to any other citizens I have ever met.

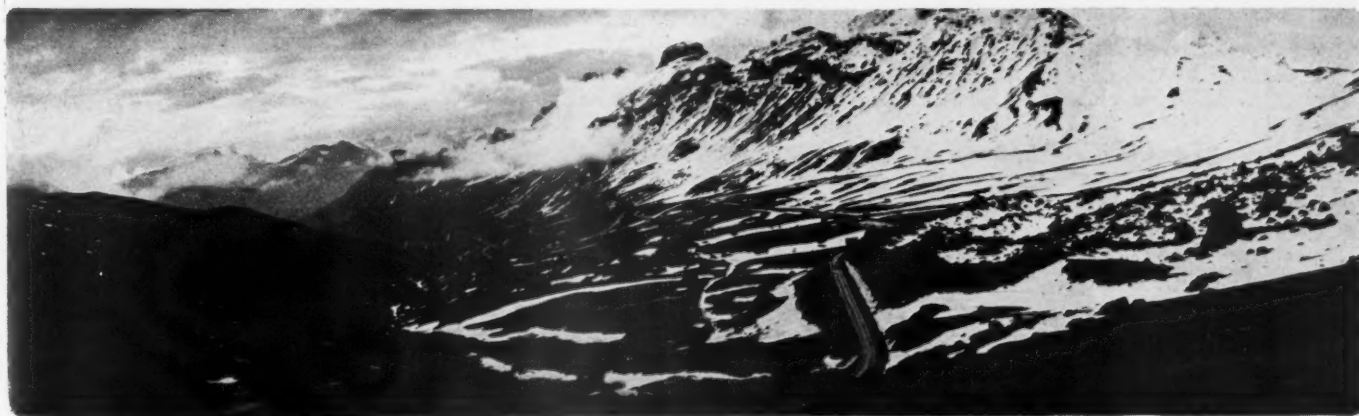
Passing along the boulevard that stretches for nearly 3 miles by the banks of the river one may almost imagine oneself at a fancy-dress ball. Costumes and color of every variety of hue and shade mingle in wild profusion. Hungarians, Greeks, and Magyars, Moslems and Polish Jews, Slavs, and Huns, Russians and Turks, soldier and civilian, merchant and



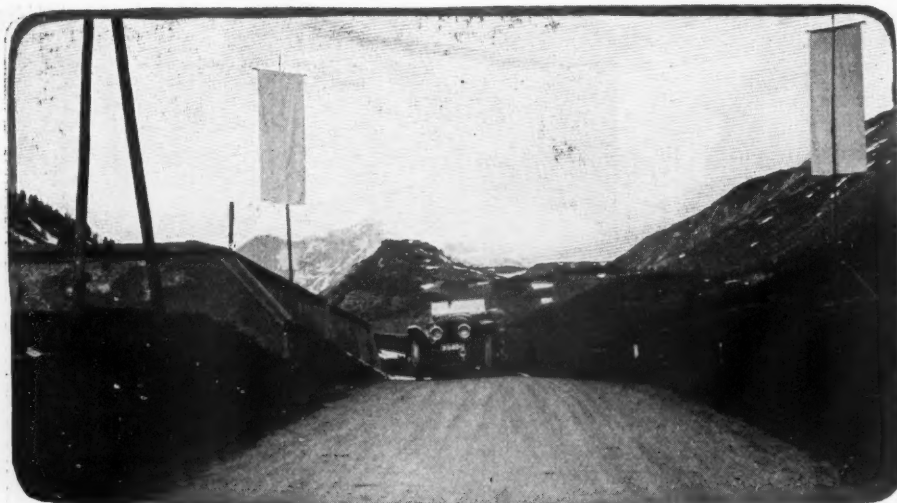
AN ENGLISH CAR IN SEMMERING PASS

peasant, all in their picturesque native costumes, mingle freely with women dressed in the height of fashion and officers in brilliant uniform—surely the most cosmopolitan crowd to be met with in the course of a year's travel, all passing to and fro on one of the most remarkable streets in the world, the Francis Joseph quay. Planted with trees and lined with cafes and hotels, its appearance in the evening is something that stamps itself at once upon one's memory.

And beyond Buda Pesth—towards the east, the road ends—lost in the maze of many nations and a myriad of tongues, where Turk and Greek, Slav and Serb, Roumanian and Bulgarian, Galician and Bohemian are weaving out their destinies at the loom of time—in much bitterness of spirit, and the gloom of centuries of



THE PORDOR PASS FROM AUSTRIA AND ITALY, A TRYING CLIMB



KER AND PARTY AT THE TOP OF TAUERN PASS

strife hovers over all. From the North sea to Buda Pesth we have passed over the great highway of Europe, on which the world's traffic surges with ceaseless ebb and flow. From east to west, from west to east, it carries the products of all nations—threading the old world in endless agitation—bearing a mighty interchange of custom, thought and speech, mounting the barriers of race and religion, slowly but surely linking up the forces of a common humanity.

Like a great sensory nerve across the heart of Europe it pulsates with action and movement, and its rhythmic beat is the true index of the life of many empires. Its story will tell you of Roman conquest—of Attila, that "scourge of God," who with his horde of Magyars and Huns and Vandals scattered the mighty empire of Rome to the winds of Heaven—of the great Charlemagne and his battles in the cause of freedom—of the wars of the crusades, and the struggles between cross and crescent—of the breaking up of ancient dynasties, and the separation of Teuton and Saxon, of Slav and Hun—of the triumph and defeat of Napoleon, and readjustment of international authority. Much history has been made on this road.

#### Few Signs of a Great Awakening

To all who seek, the Great High Road will impart "tidings of invisible things," and will speak of brighter days and the coming of understanding among nations: of more enlightened ways, and of the quickening of thought. Where the Great Road ends—where Buda Pesth and the east begin—there are few signs of the great awakening, and one is inclined to accept the poet's dictum that "never the twain shall meet," but we cherish the thought that the road will break the fetters of the east, as it has burst the bonds of the west, and its magic spell will spread from the white sands of the western Black sea in the east. The romance of the road is with us now as strong, as powerful as in the pageant days of Roman emperor or crusader knight.

Wagons of war now rumble over the

Great High Road for the nations of Europe are at one another's throats. This is true also of the picturesque highway that winds along the valley of the Meuse where epochal history now is being written, a much-traveled route through Belgium which I had the opportunity of driving over just before the pot of militarism boiled over.

The main road from Paris into Belgium enters the Meuse valley at Givet, within a few miles of the Belgium frontier. Givet lies in the heart of the Ardennes, a range of hills about 2,000 feet above sea-level, which divides France from the southwestern portion of Belgium. The hills are thickly wooded, and are intersected in every direction by winding byroads and woodland paths. The entire neighborhood was covered by an immense forest—in Caesar's time its classic name being Arduenna Silva—but the valleys today are mostly under cultivation, and the well-kept homesteads and gardens and rich farmlands give evidence of prosperity and thrift amongst the hillfolk. Traveling northwards from France to Belgium, Givet is the last town passed on French soil. It is a small place of not more than 10,000 inhabitants, and its forbidding-looking citadel and frowning walls overlooking the town at once impress its immense strategic importance to France upon the mind of the visitor.

#### On Into Belgium

Crossing the Meuse by a handsome bridge in the center of the town, the road proceeds along the banks of the river for 2 miles, where the Belgian frontier is crossed at the village of Heer. At this point we enter one of the national roads through Belgium

—wide and of excellent surface—and affording many picturesque glimpses of the river on the left. Great boulders of rock, clad in tall bracken and many-colored mosses, overhang the road, the dark woods above throwing sombre shadows across the path.

#### The Fortress at Dinant

From Heer to Dinant, the next point on the route, is a distance of 10 miles, and on the journey, if accomplished on a bright summer day when the Ardenne woods are aglow with color and resound with the music of birds, is one that lingers in one's memory. Dinant is one of the most important citadel towns in southern Belgium. The walls of the fortress, through which heavy guns peer at you in uncanny fashion, entirely surround the summit of the rock which rises precipitately from the river bank. The town itself, full of many antiquities, winds round the base of the fortress in dark, narrow streets, laid with paveé. Many of the buildings date back to medieval times, notably that of the Englisé Notre Dame, which was built in the thirteenth century, and is a fine specimen of early Gothic architecture. The Town House (Hotel de Ville), another interesting building, was at one time the princely residence of the prince-bishops of Liege. The population of Dinant is 7,500. Many old-world castles and abbeys in the neighborhood, still in a fine state of preservation, testify to the antiquity of Dinant, and to its importance in the dark



VIEW ON THE SEMMERING PASS



ages and many a dungeon has its tragic tale of battle and strife. What will be added to the grim story of Dinant before the present struggle is over, who shall say?

From Dinant to Namur, our next place of importance on the route, a distance of 17 miles, the road continues by the tree-clad banks of the Meuse. Crossing the Meuse by a strongly fortified bridge before reaching the end of the narrow main street in Dinant, we proceed along the left bank of the Meuse. Many weather-beaten ruins of ancient castles and palaces crown both banks of the river, Polvaiche and Crevecoeur—a few miles from Dinant—particularly impressing the tourist with their magnificence and beauty. Yvoir, laid out in picturesque terraces, is seen on the opposite side of the river. At this point the road leaves the river bank for some distance, and in stiff ascents and descents winds through stately woods which overhang the road for a considerable distance.

#### Namur, Center of Siege

The river comes into view again at Riviere, and by a fine level stretch enters the ancient town of Profondeville. At a bend in the river, a trifle more than a mile beyond, we have a fine view of the beautiful city of Namur and its magnificent fortress, overlooking the landscape for miles around. Namur, with a population of 31,000, is the most important city in the southwest of Belgium. It occupies a central position, being 40 miles southeast of Brussels, 60 miles southwest of Antwerp, and 40 miles west of Liege. It is essentially a military town, and soldiers are greatly in evidence in all the hotels and cafes, and in the main thoroughfares. The town has been modernized considerably in recent years, and some handsome buildings line the Rue de Bruxelles and Rue St. Jacques. The cathedral, built in 1751, is not an impressive building, its architecture being of a sadly mixed character. The old town has entirely disappeared, owing to its repeated bombardments and devastating sieges. There are few conti-

nental wars, from medieval times to modern days, in which the town has not figured. The present citadel occupies the summit of a bold promontory which stands out in the river at the point where the River Sambre enters the town. One can form no impression of its strength when entering the town from the south, as the rock rises abruptly from the river, and completely hides the fortress at the top.

#### A Spectre of Gloom

Once across the bridge over the Sambre, however, its mighty fortifications are quickly apparent, and one can readily understand its power of resistance and impregnable strength in time of siege. With no thought of war in my mind when a year or two ago I spent some time looking at this grim fortress, I remarked to my companion that it seemed to me a pity that such a gaunt spectre with its gloom and shadow should be necessary in the midst of fair corn fields, happy homesteads and peaceful rivers, now carrying produce and the fruits of labor through the land. It seemed a frightful waste of energy and of the nation's resources. My companion, I thought, took a gloomy view—"You never know when it will be needed," and today we know too well that he was right—that the day was not far distant when these walls would again echo the roar of cannon and give their strength and might in defense of the rights of a peace-loving, industrious people.

#### NO SEPARATE TRUCK SHOW

Boston, Mass., Oct. 12—There will be no separate motor truck show in Boston next March, but a combined passenger car and commercial vehicle exhibition at the one



TWILIGHT RIDING IN AUSTRIA

time in Mechanics' building. This was the result of the annual fall meeting of the Boston Automobile Dealers' Association and the Boston Commercial Vehicle Dealers' Association held last week. The matter was given careful consideration and the members of the latter organization felt that a separate show would be unwise, and they agreed to accept space in the basement of Mechanics' building for their trucks and delivery wagons. Much of the space for passenger cars already has been spoken for by the Boston dealers, and there are new applicants coming in daily.



MILITARY ROAD IN AUSTRIA WITH CITY OF BOZEN IN DISTANCE



# Boston Stages Interesting Display of Motor Cars

## Racing Also a Feature of Hub Demonstration

BOSTON, Mass., Oct. 12—The first real display of low-priced cars and cycle-cars ever held in this country opened at Horticultural hall today. What many dealers figured would be a relatively small exhibition turned out to be much more pretentious than even the management of the exhibition expected, for there were twenty-five different makes represented, and foreign machines were among the exhibitors. A number of the latter were driven over the road from New York last week.

Horticultural hall, where the show is being held, is on Huntington avenue, near the Mechanics' building that houses the big motor shows, and was used in past years as an overflow building for the Boston show. The cars are grouped about the main hall and in the alcove and they make an impressive display. The hall has been decorated somewhat and this adds to the appearance of the cars. The show is to continue for a week.

There is a very great difference between this exhibition and the scramble of machines exhibited in connection with the Boston motor show last March. In the other show there seemed to be more of a tendency to tin-pan effects, as if each purchaser of some cars were entitled to an accident insurance policy, the machines looked so fragile. Now, however, the exhibits have a tendency to sturdiness and stability. The freaks have vanished. Instead of a preponderance of two-cylinder, air-cooled machines, there is a far greater number of four-cylinder, water-cooled models.

There are twenty-four different makes represented. Of this number, twenty-one are displaying four-cylinder water-cooled motors. Two of the twenty-one, the Imp and the Dudley Bug, also make two-cylinder air-cooled models. The other three are two-cylinder air-cooled types. The greater number show bodies with the passengers setting side by side, although there are three that have the tandem style. It was expected that there would be four more makes represented, and these four may come in before the show ends. One of the missing is the Burgatti from Italy, and if it shows up it will make the show somewhat international, with the Morgan from England and the Sigma from France, now here. The Carnation is the only one showing a four-passenger body. The large number of cars and particularly the big delegation from the middle west exhibiting makes it a really representative light car show.

The Coey, four-cylinder, water-cooled, two-passenger sociable, is exhibited by the Coey Motor Car Co., Chicago.

The Trumbull, four-cylinder, water-cooled, two-passenger sociable, is shown by the Boyd Motor Co., 148 Berkeley street, Boston.

The Dudley Bug, four-cylinder, water-cooled, also a two-cylinder, air-cooled, two-passenger sociable, are exhibited by the Dudley Cyclecar Co. of New England.

The Princess, four-cylinder, water-cooled, two-passenger sociable, is displayed by the Princess Motor Car Co., Detroit, Mich.

The Merz, four-cylinder, water-cooled, two-passenger, is shown by Charles Merz, of Indianapolis, Ind.

The Vim, four-cylinder, water-cooled, built for delivery purposes, is shown by A. E. Kenny, Boston, Mass.

The Mohawk, four-cylinder, water-cooled, two-passenger sociable, is exhibited by the Mohawk Motor Co., Boston, Mass.

The Grant, four-cylinder, water-cooled, two-passenger sociable, is displayed by the H. J. Koehler S. G. Co., Boston, Mass.

The Tiger, four-cylinder, water-cooled, two-passenger sociable, is exhibited by W. A. DeSchaum, Detroit, Mich.

The Remington, four-cylinder water-cooled, two-passenger sociable, is shown by the Remington Motor Car Co., New York City.

The Peter Pan, four-cylinder, water-cooled, two-passenger sociable, is exhibited by the Randall Motor Car Co., Wollaston, Mass.

The Kearns, four-cylinder, water-cooled, two-passenger sociable, is displayed by the Kearns Motor Truck Co., Beavertown, Pa.

The Vixen, four-cylinder, water-cooled, two-passenger sociable, is exhibited by the Davis Motor Co., Milwaukee, Wis.

The Imp, four-cylinder, water-cooled, two-passenger sociable, and two-cylinder, air-cooled, two-passenger tandem, are shown by the McIntyre Motor Car Co., Auburn, Ind.

The Zip, four-cylinder, water-cooled, two-passenger sociable, is displayed by the Zip Motor Car Co., Davenport, Ia.

The Salvador, four-cylinder, water-cooled, two-passenger sociable, is shown by the Salvador Motor Co., Boston, Mass.

The Twombly, four-cylinder, water-cooled, two-passenger tandem, is exhibited by H. Ross Maddocks, Boston, Mass.

The Carnation, four-cylinder, water-cooled, two-passenger sociable, also four-passenger touring, are shown by the Dudley Cyclecar Co. of New England.

The Dayton, four-cylinder, water-cooled, two-passenger sociable, is exhibited by the Dayton Motor Car Co., Joliet, Ill.

The Morgan (English), four-cylinder, water-cooled, two-passenger sociable, is shown by A. P. Allen, New York city.

The Sigma (French), four-cylinder, water-cooled, two-passenger sociable, is shown by Robert P. Breeze, New York city.

The Mercury, two-cylinder, air-cooled, two-passenger tandem, is shown by A. E. Kenny, Boston.

The Scripps-Booth, two-cylinder, air-cooled, two-passenger tandem, is shown by the Scripps-Booth Motor Car Co., Detroit, Mich.

The Saginaw, two-cylinder, air-cooled, two-passenger sociable, is exhibited by the Saginaw Cyclecar Co., Saginaw, Mich.

Track races were run off at Combination park, Medford, Saturday afternoon, before a good crowd. There were ten machines entered, one from England and another from France, the remainder being American-made. Summary:

Five-mile Race, Class A, Cyclecars—Donald Pope, Dudley Bug, won; Felix Feroli, Imp, second; E. C. Andrews, Merz, third. Time, 8:56.

Mile Exhibition by English Morgan, driven by Richard Allen, London, Eng. Time, 1:35½.

Five-mile Race, Class B, Small Cars—R. P. Breeze, Sigma, won; W. A. DeSchaum, Tiger, second; E. H. Riopel, Zip, third. Time, 7:32½.

Handicap, Man, Horse and Car—Festus Madden won; horse N'Importe, second; English Morgan, third.

Two-mile Match Race Between Sigma, Tiger and Zip—R. P. Breeze, Sigma, won; W. A. DeSchaum, Tiger, second; R. H. Riopel, Zip, third. Time, 3:21.

Two-mile Exhibition Against Time—H. I. Bailey, Trumbull. Time, 3:02½.

Match Race, Sigma vs. Tiger—Won by R. P. Breeze, Sigma. Time, 3:07½.

Fifty-kilometer Free-for-All—W. A. DeSchaum, Tiger, won; G. J. Goewey, Coey Bear, second; Felix Feroli, Imp, third.

### DETROIT WANTS A SPEEDWAY

Detroit, Mich., Oct. 12—With the incorporation this week of the Speedway Country Club, the speedway building germ again

is rampant in this city. According to the promoters, a 2½-mile brick track will be built on land adjacent to the water, 400 acres now being held under option. The plans call for a track 100 feet wide, 20 feet wider than the Indianapolis speedway, with highly banked turns to permit of record speed, such as that made at Brooklands. Concrete retaining walls will be built both on the outside and inside of the track, and grandstands, capable of seating 300,000 persons, will be erected. A clubhouse also will be built and an eighteen-hole golf course laid out in the infield. The promoters hope to have the speedway completed by July.

### PACKARD MAKES REPORT

Detroit, Mich., Oct. 14—From a statement by the Packard Motor Car Co. made today it was learned that the business for the year ending August 31 resulted in a surplus of \$1,797,820.42 after deducting for depreciation on the plant, paying interest on notes, paying expenses of the business, dividends on the preferred stock, setting aside proper reserve and a special distribution of common stock. The company made 3,612 cars in the fiscal year.

### APPERSON RE-ELECTS OLD OFFICERS

Kokomo, Ind., Oct. 12—The Apperson Brothers Automobile Co. at its annual meeting re-elected the following officers: Elmer Apperson, president; T. E. Jarrard, vice-president; Edgar Apperson, secretary and treasurer. The usual 10 per cent dividend was declared.

### SIX ENTERED AT CORONA

Corona, Cal., Oct. 9—Six cars already are entered for the Corona road race which is scheduled for Thanksgiving day. Walter M. Brown of Los Angeles has entered three Stutz racers and the Pacific Coast Mercer agency has nominated three machines, notwithstanding the fact that the Mercer factory retired from the racing game for the season after the Wishart accident.

Eddie Pullen, winner of the grand prize race at Santa Monica last spring, is to pilot one of the Mercers and the other drivers of the team are Caleb Bragg and Guy Ruckstall, the young driver who made his debut in the Panama-Pacific race and who has climbed to the front as a driver of racing cars on the Pacific coast within a comparatively short time.

The Stutz team as announced by the Corona Racing Association is to be composed of Earl Cooper, winner of the first annual Corona classic; Barney Oldfield and Gil Anderson. Oldfield drove a Mercer in the Corona speed duel last year and turned over. The veteran announced some time ago that he would not drive again at Co-

rona, but he has been entered as the pilot of the car which he drove in the 500-mile race at Indianapolis and at Elgin, and Walter M. Brown claims that he will start in the 300-mile Corona event unless he meets with a serious accident in the Phoenix road race which is to take place a short time before the Thanksgiving day grind.

While the Mercer and Stutz teams are the only entries in at this time, it is practically assured that the Ono racer which was wrecked on the Tacoma speedway July 4 will be in the lists. Frank Young, owner of the car, has it rebuilt and has signed F. S. Brock to drive in the Corona race.

The Ono is the old Fiat which carried Teddy Tetzlaff to a new world's record on the Santa Monica course in 1912. The machine has been rebuilt and the Fiat engine has been replaced by a Pope-Portola motor, and since the wreck which almost cost the lives of Bert Dingley, the driver, and Ed Swanson, his mechanic, the car has been completely repaired and is said to be good for more than ninety miles an hour now.

The King racer which appeared in the 500-mile race also is to be entered in the Corona race.

#### GALESBURG RACE POSTPONED

Galesburg, Ill., Oct. 14—Because of recent rains and the muddy condition of the track, it has been found necessary to postpone the 100-mile dirt track race that was to have been run today. The event will be run Saturday. Ready for the race are de Palma, Mulford, Burman, Alley, O'Donnell, Gallagher, Gable, Gunning, Rawlings and Callaghan.

#### DANVILLE HOLDS HILL-CLIMB

Danville, Ill., Oct. 10—Under the auspices of the Danville Garage Owners' Association, the first annual hill-climb at Langley hill, near Danville, attracted thousands of spectators and was a success beyond anticipations. The following is a list of the winners:

Cars under 230 cubic inches—Fred Roberts, Ford, won; time, 0:37; Orville Hardin, Ford, second, 0:37½; R. Sellers, Ford, third, 0:41½.  
Cars under 300 inches—Fred Roberts, Ford, won; time, :38; Carl Reynolds, Ford, second, :38½; Will Hartshorn, Cadillac, third, :45½.  
Cars under 400 cubic inches—R. Holmes, Cadillac, won, time :38½; C. H. De Long, Ford, second, :40; R. Sellers, Ford, third, :41.  
Stock cars with full equipment, costing \$1,000 or under—Archibald Hoffman, Ford, won, time, :46; R. Sellers, Ford, second, :47; Paul Moore, Studebaker, third, :51.  
Free-for-all, open to all gasoline cars—H. L. Johnson, Shambaugh, won; Fred Roberts, Ford, second.

In the women's fancy driving contest, Miss Ida Strain, of Danville, won first prize and Miss Lola Swisher, Danville, won second.

#### HUPP TO CONTINUE MODEL 32

Detroit, Mich., Oct. 13—The Hupp Motor Car Co. has decided, owing to the general demand of its dealers, to continue to manufacture in 1915 the model 32 in addition to the new model K announced some time ago. Next season's price for the model 32 roadsters and touring cars is \$950 f. o. b. Detroit instead of \$1,050 this year, and the price in Canada is \$1,230 f. o. b. Windsor. At these figures electric starter and lighting system are not included, but with such

equipment the price will be \$1,050, as compared with \$1,200 in 1914.

#### PIGGINS COMPANY REORGANIZING

Racine, Wis., Oct. 12—The Piggins Bros. Motor Truck Co., Racine, Wis., which went into bankruptcy about a year ago, is being reorganized by the Piggins brothers and expects to resume operations about November 1 in the former plant on West Sixth

street. The entire equipment was sold at bankrupt sale to the Badger-Packer Machinery Co., Milwaukee, and most of it has now been repurchased by the Piggins interest and is being installed in the plant. The Racine company has secured enough financial backing to enable it to resume the manufacture of the Piggins interal spur gear drive truck and will conduct a general repair and jobbing shop.

## Electric Cars Displayed in New York

### Fifteen Machines Included in Palace Show

NEW YORK, Oct. 10—Fifteen cars are shown by six exhibiting companies at the electrical exposition and motor show which opened in Grand Central Palace on Wednesday, October 7, to remain open until October 17. In addition there are several other companies exhibiting products of interest and use to electric vehicle owners, while the machine shop and garage shown on the third floor are of interest to gasoline car owners as well.

There are three passenger car exhibitors, the Baker Motor Vehicle Co., Cleveland, O.; Rauch & Lang Carriage Co., Cleveland, O., and the Anderson Electric Car Co., Detroit, Mich. Most of the cars shown are commercial vehicles, the exhibitors being the General Vehicle Co., Long Island City; the Commercial Truck Co. of America, Philadelphia, Pa., and the Ward Motor Vehicle Co., New York city.

The Baker exhibit consists of a single car—a double-drive brougham, model BBD, upholstered in dark green cloth. The lever control system is fitted with an interlocking device, preventing the use of more than one set at a time. The control lever is set just above the steering lever and is considerably shorter. The controller is of the continuous torque drum type and gives six speeds forward and three reverse. An automatic circuit shuts off the current when the emergency brake is applied, and the current cannot be turned on again until the brake is released. The car sells for \$3,000 with bevel gear drive and \$3,250 with worm drive.

The Rauch & Lang company shows two cars, both broughams, one a double-drive model costing \$3,200 and the other a single drive at \$2,950. Both have the characteristic R. & L. worm-drive system, in which the motor drives through a short propeller shaft with two universal joints direct to the worm. The worm is carried on ball bearings above the gear. The springs are long and flexible, sashless windows, deep and comfortable upholstery, complete lighting and full equipment being provided.

The Anderson company has the largest exhibit of pleasure cars, showing two Detroit electric broughams and one cabriolet. These models were fully described in Motor Age for October 8 and further comment is unnecessary other than to state that they are up-to-date in every partic-

ular and fitted with the most complete equipment. All but one of the six body types for 1915 are mounted on 100-inch wheelbase underneath worm-drive chassis, while the other is fitted to a 94-inch bevel-drive chassis. Among the improvements on the new cars are the new wiring method, facilitating body removal, increase in battery capacity, better protection for mechanism, and the drip moulding over the doors for protection against the rain.

Prices on Detroit electrics range from \$2,600 for the 94-inch wheelbase car with lead battery to \$3,880 for the five-passenger with Edison battery.

The General Vehicle Co. shows a 2-ton chain-drive chassis which is painted in a variety of colors, each color distinguishing a separate system. For instance, the brake system is all one color, the control system another, the drive system another, and so on. There is a large chart explaining the significance of the various hues. On the track there is a 1,000-pound chain-drive car with a standard department store type of body. The exhibit on the main floor consists of two cars, a 1,000-pound worm-driven truck with panel body and doors, as in pleasure cars, at the driver's space, and a 1-ton chain-drive model with standard panel body.

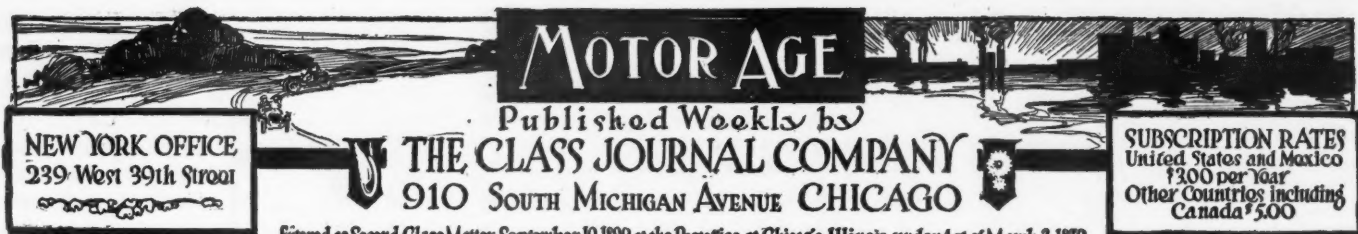
The Commercial Truck Co. shows a 1,000-pound truck with two-motor drive direct to the wheel, there being no axle shafts or other intermediate members except for the reduction gears, which are built into the casing between the motor and the wheel.

An extensive exhibit is made by the Ward company, comprising four trucks and a chassis, ranging from the new little delivery car with steel panel body, the price of which is \$875, to a big 5-ton truck.

The Garage and Machine Shop exhibit on the third floor includes a variety of machine tools ranging from a heavy motor-driven lathe to a light drill press. The Andrew Greis Co., New York city, shows a corrugated steel garage beside the track on which demonstrations and tests are being given.

Philadelphia, Exide, Edison and Gould batteries are shown complete and in detail, and, although there are no radical changes, it is noticeable that thin plates are much favored for lead batteries.





**MOTOR AGE**  
Published Weekly by  
**THE CLASS JOURNAL COMPANY**  
910 SOUTH MICHIGAN AVENUE CHICAGO

NEW YORK OFFICE  
239 West 39th Street

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879  
Member of the Audit Bureau of Circulations

SUBSCRIPTION RATES  
United States and Mexico  
\$3.00 per Year  
Other Countries including  
Canada \$5.00

## Demonstrating Trucks

**D**OES it pay to demonstrate motor trucks when selling the same? Thousands of dealers have asked themselves this question. A great percentage of these have seen the error of pre-demonstrations, some have seen the error of making charges for demonstrations, and few have been enterprising enough to practically discontinue all kinds of demonstrations and sell a motor truck on the same basis that you would sell a piano, a typewriter, a self-binder for the farm, an electric motor for the street car, or any other standard piece of machinery.

**T**HE buying public has been educated up to the fact that legitimate business houses only sell articles that will perform as represented. For example, the typewriter manufacturer followed this course. You buy an elevator for a forty-story building and it is not necessary for you to demonstrate this elevator for several days free, or even under a charge basis for several weeks. When the factory fits a machine tool, it is not demonstrated for several weeks before the order is placed. The same is true in hundreds of other business lines.

**T**URNING to the motor truck field, after a brief survey of selling in other industrial lines, it is not surprising that you should ask the question, Why demonstrate at all when so many makes of trucks are being used in all of the cities of the country 300 days in the year? If motor trucks were not being used it might be necessary to demonstrate, but why demonstrate trucks in cities where there are perhaps hundreds of the same make operating and have been operating for several weeks.

**S**OME interesting side-lights on how demonstrating in selling motor trucks actually works out were given at the motor truck convention last week in Detroit by J. C. Ayres, a dealer in one of our large cities. His experience extended over three cycles in the demonstrating field. First came a period of 1 year of free demonstrations; this was followed by a period of 14 months when demonstrations were charged for, and this in turn was followed by another period of 10 months when no demonstrations were made. The results follow:

**D**URING 12 months of free demonstrations, eighty-one demonstrations were made, and but one sale was made out of this total. Other companies selling trucks sold four vehicles to some of the eighty-one concerns to which the demonstrations were made. The net result is that but 5 per cent of the prospects to whom demonstrations were made actually purchased trucks, and that

at the end of the period 95 per cent had not made purchases. It would scarcely be necessary to conclude that it is a poor business policy to make eighty-one demonstrations and sell but one truck. Something must be wrong with such a system. That is too low a percentage of sales to be classed in the column of good salesmanship.

**L**OOK next at the result of 14 months in which charges were made for demonstrations, the schedule of demonstrations ranging from \$8 to \$25 per day, according to the truck capacity. During 14 months 87 per cent of the concerns which paid for demonstrations purchased trucks. During this time a very few free demonstrations were made to special parties, and only one truck sold as a result. From 14 months of such business there is only one conclusion to draw, namely, that charging for demonstrations is superior to making free demonstrations.

**L**ASTLY, we must consider the cycle in which no demonstrations were made for a period of 10 months or longer. Under such a regime it is impossible to arrive at any percentage of success, and the only figures available are that the total percentage of business during the period was greater than under the regime of charge demonstration, or the regime of free demonstration. In a word, sales increased when no demonstrations were made.

**E**VERY motor truck dealer should look this question of demonstrating square in the face. He should look at it as a business proposition only. He must look at demonstrations in the same way that a watch manufacturer does. The watchmaker brings out a new model, much thinner and smaller than previous models. When you buy one of these new models you do not ask for a free trial of 3 months, neither do you ask for the permission of renting the watch or demonstrating it on a charge basis for the same period. It is the business of the watchmaker to manufacture watches that will keep time, and when you buy it you do so on this assumption. The same is true of the company buying passenger or freight elevators for a building; the same is true of scores and hundreds of other industries. In view of this let us ask ourselves the question why it should not be true of many makes of motor trucks that have been on the market for years and are manufactured by reputable concerns that have established names for themselves in this particular line. The only conclusion is that there should not be any more necessity for demonstrations of motor trucks falling into such a category than for a camera or a sewing machine.

## European Roads in War Time

**O**NE phase of the European war has not been given much consideration on this side of the Atlantic. That has to do with the possible destruction of the highways traversed by the armies. Maybe the thought has not hit the powers that be, but it would seem that before long it will become the practice to blow up sections of the roads just as is done with bridges in order to prevent the movements of the enemies' forces. With motor cars the chief mode of transportation, a section of road

blown up would slow the attack just as effectively as a bridge destroyed. But there is no big loss without some small gain. If the highways of France and Belgium are blown up in this manner, then there would be afforded a chance for these countries to adopt modern methods in reconstructing the roads after the war is over. With a free hand, it would be possible to construct highways that would serve as models for the world and give an opportunity to try out new theories.



# Americans Continue to Protest Against War Taxation

WASHINGTON, D. C., Oct. 13—Special telegram.—Despite the fact that the senate democratic caucus decided to eliminate the tax on motor cars and gasoline, congress continues to be flooded with protests against the proposed tax. If the house has any idea of reviving the tax the thousands upon thousands of protests surely will tend to convince the representatives of the people that such a tax would be a death blow to one of the greatest industries in the country.

Senator Simmons, chairman of the senate finance committee, in a speech said that the war emergency tax would prove unpopular.

Senator Borah yesterday predicted that another revenue would have to be passed in a short time imposing additional taxes, and if this is so, the motor car manufacturers are likely to suffer.

Yesterday Senator Simmons tried to get an agreement by unanimous consent for a vote on the war revenue bill October 22, but Overman objected and disclosed for the first time that the senators from the cotton growing states were preparing to offer as an amendment to the war bill legislation to help out the cotton planters in the south. The cotton senators have just concluded a conference to decide on the form of amendment to be offered later, and they say will be satisfied if they can get a vote on it and will not obstruct the passage of the war revenue bill in case the amendment fails.

## Boston Dealers Fear War Tax Danger Is Not Past in Congress

BOSTON, Mass., Oct. 10—Boston dealers are delighted over the success of the mission they sent to Washington to protest against the taxes on motor cars in the war revenue bill. After reading what the effect of the bill would be the Boston Automobile Dealers' Association met and decided to send a committee to Washington, John H. Johnson of the Buick, J. W. Maguire of the Pierce-Arrow and Joseph Donovan of the Studebaker being chosen. While other organizations contented themselves with letters and telegrams the Boston men appeared in person and had a good chance to state their case.

They learned while there, however, that while the senate sub-committee dropped the tax the fight is not yet over. The matter must come before the house committee, and there are a number of congressmen who have stated that the motor cars should be taxed. Therefore the house committee may draft a new amendment putting the tax back again in the bill. So the Boston committee talked with a number of the congressmen about it, and they have sent word to dealers throughout New England to get in touch with their men and do something.

### PLANTATION RUBBER TIRES TESTED

London, England, Oct. 3—Four tires, made entirely from Hevea plantation para, have been submitted to a 4,000-mile test under R. A. C. observation. The trial was made at the instance of the North British Rubber Co., of London and took place from June 18 to August 1. A certificate has just been issued in which the following facts have been noted:

The tires were of the non-skid type, size 895 by 135 millimeters, fitted to a 60-horsepower—R. A. C. rating—six-cylinder Napier car. The car weighed 4,411 pounds and the load carried was 643 pounds, giving a total running weight of 5,054 pounds. The car was fitted with wire wheels with the inflation at 90 pounds. The trial was held over ordinary roads in England and Scotland. The first cover burst at 3,077 miles and was withdrawn. The second ran 4,018 miles and while no work was done

upon it the casing was found to be sound at the end of the trial. The third was deflated at 3,134 miles due to a pinched inner tube and again at 3,622 miles by a blowout through the cover. With this patched the two completed the test. The fourth was deflated at 2,727 miles, due to the tube being nipped in some cracks in the inner lining of the casing. A tube cover completely enveloping the tube for its entire length was fitted and with this the two completed the test. In a word, three out of the four successfully completed the run of 4,000 miles.

### S. A. E. SLATE MADE UP

New York, Oct. 12—W. H. VanDervoort, president of the Moline Automobile Co., has been nominated for the presidency of the Society of Automobile Engineers for next year by the nominating committee, to succeed Henry M. Leland, who has occupied this post during the present year. Mr. VanDervoort has had wide experience that should qualify him for this post. In addition to his experience as a manufacturer, he was, previous to his connection with the motor car industry, a professor in the University of Illinois.

The complete list of officers nominated follows: President, W. H. VanDervoort; first vice-president, Frederick R. Hutton; second vice-president, Joseph A. Anglada; treasurer, A. B. Cumner. Counselors: C. B. Rose, 1915-16; John Wilkinson, 1915-16; W. P. Kennedy, 1915-16; Frank M. Germane, 1915.

### VOITURETTE CREDITORS MEET

Detroit, Mich., Oct. 9—At the meeting of the creditors of the American Voiturette Co. it was decided to continue and build quite a large number of Carnation cars and a few Keetons, for which all the needed parts and material to assemble them is on hand. Together with the finished Carnations on hand there will be 375 such cars, which will be offered for sale at a uniform price of \$250, while the Keeton cars will be offered at \$1,000. If the Detroit Trust Co. does not receive a satisfac-

tory offer within the next few days, it is likely that an auction sale will be arranged to dispose of the cars.

The creditors appointed a committee to work in conjunction with the receiver in bringing about the best possible settlement of the affairs of the company.

### CHALFANT AGAIN IN TRADE

New York, Oct. 10—E. P. Chalfant, formerly general manager of the A. L. A. M. and also identified with the Packard and Thomas companies, has returned to the motor industry after an absence of several years. Mr. Chalfant now is secretary of the Electric Automobile Manufacturers' Association and will establish headquarters either in Chicago or Cleveland.

### F. R. BUMP WITH STUDEBAKER

Detroit, Mich., Oct. 10—F. R. Bump has joined the Studebaker Corp. and will have charge of the New York branch of the firm. Mr. Bump has been sales manager of the Franklin Automobile Co. and of the R-C-H Corp. and assistant sales manager of the Hupp Motor Car Co. and the Universal Motor Truck Co.

### BAY STATE LAW NEEDS CHANGING

Boston, Mass., Oct. 10—While no statement can be secured officially from officers of the Massachusetts highway commission it is known now that there has been some dissatisfaction with the motor law put into effect this year that changed the 10-day clause to 30 days, for visiting motorists. The commission got in a good stock of its visitors' registration plates as usual, but there were calls for fewer than fifty, so the others will have to be thrown away. Many summer visitors who have paid registration fees for 3 months found that they had to pay a full year's fee this year, and this was so unjust that some of them were not at all backward in expressing their opinions on the matter. So it is very evident that the commission will seek to have the law changed, or the Massachusetts State A. A. will try to do it.

# European Trade Situation Diagnosed by Sturme

## Present Conditions Explained by Prominent Critic

*Editor's Note—Henry Sturme, regarded as one of England's leading motoring journalists, points out clearly and logically the exact trade situation, not only in Great Britain, but in other countries involved in the present war. His article should be of value to American manufacturers who are of the opinion that they can enter the European market without opposition.*

**L**ONDON, Oct. 1.—If I may judge by what has appeared in Motor Age and other American journals which have reached this side since the commencement of the war, I conclude that the trade conditions on this side of the Atlantic and particularly in Great Britain are not clearly understood, and the following notes may help to make the position clear.

As has been stated already in Motor Age by W. F. Bradley, manufacture in France is very largely at a standstill by reason of the withdrawal of the employees for the army. Had the Germans succeeded in their effort to invest Paris, there is no doubt that to this would have been added the destruction of the factories themselves and as nearly all of the French motor car factories are situated in the environs of Paris this would have meant a very severe blow to the French industry.

Happily this danger has been avoided, but, while the war lasts, France may be counted out as a producer of motor cars and the same may be said of Belgium and Germany. But France, Belgium and Germany are not the only motor car producing countries in Europe. So far Italy has not joined in the war and, so long as it maintains its present attitude of neutrality, not only can the Italian factories produce as before, but Italian ports being open, they are also free to export to foreign markets. The above conditions, as regards the countries mentioned, has been fully recognized on your side, but the conditions in Great Britain certainly are not understood.

### Conditions in England

We are at war like the rest of them, but thanks to our island situation, the efficiency of our fleet and the voluntary nature of our army, the internal conditions of the country as affected by the war are very different from those of the continent. In the first place, we have no conscription here for the army, so that every man in the country of military age is not being dragged out of the factories by the war.

Lord Kitchener has asked for a million men and this number is now nearly completed, entirely by volunteers. But a million men is less than five per cent of the population and while this call upon the manhood of the country has reduced the labor available, this has not been the case to the extent of seriously crippling production. Most firms in the country, in reservists and volunteers, have lost the services of a number of men, but in few cases more than 10 per cent or 15 per cent of their establishment and while this, of course, has necessitated a certain amount

### By Henry Sturme

of reorganization within the factories, it has in no way stopped them.

Had all other things been equal to the condition pertaining before the war, a very large number of those who have taken up arms in the service of their country could have been replaced. But the effect of the war has been to affect credit and heavily affect demand, not only as regards our trade with the continent, but particularly in regard to our home trade. The motor car is, when all is said and done, still something of the nature of a luxury and, in a very large proportion of cases, can be done without; so that, although the productive capacity of the factories has been somewhat reduced by the reduction in the number of hands employed, the demand for the goods produced has more than proportionately declined.

### Time Reduced at Factories

Were the total demand to be restored tomorrow to the point it had reached before the war, that demand could have been met without difficulty by working overtime. But, as it is, the demand is insufficient to keep the factories going as before, even with their depleted staffs, with the result that, instead of the standard 54 hours per week, the works are being run only from 30 to 40 hours per week. Hands have not been discharged, but time reduced, so that the factory organizations are maintained and any increase in demand can be at once met by increasing the number of hours working. Therefore it will be seen that, so far as the motor industry of this country is concerned, the production has been reduced, not by inability to produce, but by reason of inadequate demand.

It will therefore be seen that manufacturers on your side would be very unwise to heavily increase their production, as I see is suggested, in the idea that all European competition having been removed, the markets of the world are at their feet. Italy, as I have shown, is able today to maintain its output to its full capacity, while Great Britain is in a position to deal with a very much larger volume of colonial and world-wide trade than she is doing at present.

The above remarks relate particularly to the touring car position. In the realm of the commercial motor vehicle—the truck business, as you term it there—conditions are somewhat different. All the firms producing 1½ to 3-ton capacity wagons which are on the government lists have had their production practically annexed in toto by

the war office and production is being pushed to its fullest capacity. In this some of the touring car factories are helping by utilizing their plant in production of parts for the more fortunate firms. This, however, only affects some half dozen of the largest firms.

### Others Only Nominally Busy

Other manufacturers in the truck business are no more than normally busy; for, although it was concluded that, owing to the government at the commencement of hostilities having commandeered a large number of trucks in the hands of business houses, there would be a large demand upon the factories to replace these vehicles; this has only been the case to a moderate extent, for the simple reason that the withdrawal of a million men from social life and the general financial and other conditions induced by the war have so heavily reduced the volume of trade in nearly all businesses throughout the country, that the majority of firms are able to keep their distribution going with the vehicles they have been allowed to retain, while, so far as those firms which hitherto have depended upon horses are concerned and whose horses have been taken for the war, the same reduction of trade has taken place and they have been able to find sufficient replacement horses for their present needs and the purchase of a truck being an expensive matter, they are sticking to their horse traction from motives of economy of capital.

### After the War Prospects

Doubtless, when the war is over trade conditions will improve throughout the country, but so far as any large trade with the continent of Europe is concerned, it must not be forgotten that the cost of the war in all the belligerent countries—this is said to approximate \$50,000,000 per day—will throw such a strain upon the resources of the people that expenditure upon anything partaking of the nature of a luxury must inevitably be largely curtailed, and I feel sure that the European factories will be more than able to meet the home demand for a year or so which, so far as export trade generally is concerned, the fact must not be forgotten that the economic conditions are to be affected by the war, not only of the belligerent countries, but also of the entire world, even the United States meeting with its share of difficulties, interference with trade so that until financial conditions have had time to right themselves we can all look rather for a curtailment than an enlargement of foreign business.



# French Government Operating Motor Car Plants

## Most Factories Turning Out Trucks, Says Bradley

*Editor's Note—In the same mail that brought Mr. Sturmeys article was a contribution from W. F. Bradley, Motor Age's representative in Europe, who now is in active service in the British army. While Mr. Sturmeys article diagnoses the situation in Great Britain, Mr. Bradley's tells of conditions on the continent. The two are of about the same tenor and show that the trade situation abroad is not quite as desperate as we anticipated.*

PARIS, Oct. 1.—French motor car manufacturers still are limited to one customer—the government. The factories having commercial vehicle sections and those making aeroplane motors are working at high pressure under military control. Such remarkably good service has been obtained from the motor car lorries connected with the army service corps that the authorities are doing everything possible to increase the number of vehicles. It is attempted to make up the wastage of horses by more trucks instead of by more horses.

Most of the firms making touring cars only are undertaking work for the commercial motor manufacturers or are machining parts for the government arsenals. Shells, bombs, aeroplane parts, guns and gun fittings are being turned out in big quantities in some of the leading factories. The repair departments of all factories are having a busy time.

No conditions are more strenuous than those pertaining to war, and as the scene of the fighting still is very near Paris, cars are frequently sent into the capital to be repaired instead of being turned over to the traveling workshops. This work is not very satisfactory from the manufacturers' standpoint, for it is spasmodic and has to be got through in the shortest possible time. It has the advantage, however, of enabling staffs to be kept together. The skilled mechanics who have not been called up for war service have very little difficulty in finding work.

### Many in Government Arsenals

In addition to those employed in the factories, hundreds have been taken on at the various government arsenals. Unskilled laborers are in a much less favorable condition. As it is believed, even by optimists, that this war will continue until the spring, workers are settling down to new conditions, taking up whatever work they can find, rather than wait for a resumption in the factories where they formerly were employed. This means that men will become scattered and it will be longer to get staffs together than was originally imagined.

There has been no repeal of the law against the exportation of motor cars, but the authorities now are willing to give permits in individual cases for cars to be sent out of the country. This is enabling factories with stocks to get their machines into England for the English or colonial market. The volume of business done in this way, however, is small, for only cars which were completed or very near completion when the war broke out can be

### By W. F. Bradley

sent abroad. No factory in France has sufficient staffs to enable it to produce touring cars. Needless to say, the demand for touring cars at home is nil. It may be stated with certainty that not a dozen cars have been delivered to private customers in France since the war broke out.

When Paris was in danger of being invested by the Germans, several of the motor car factories doing government work were removed to the provinces. The Renault aviation motor section was taken to Lyons; Gnome went to Bordeaux; Clerget to Tours; Hotchkiss to Toulouse, etc. The entry of the Germans into Paris—we who live in the city have only just realized how closely we escaped this entry—would have had more than a moral effect. Nine-tenths of the French cars are produced around Paris, and to have isolated this enormous source of supply from the army would have had a most disastrous effect. Now that the danger of an advance on Paris appears to be at an end, arrangements are being made for the removed branches to be returned to the city.

### Looks Bad for 1915

Motor car manufacturers have not yet been able to size up how the industry will stand when the war is over. Although there is a firm conviction that the allies will triumph, men of knowledge do not look for an easy victory. Many are of the opinion that the war will last throughout the winter and may come to an end in the spring. It can be accepted as certain that there will be no 1915 models.

Supposing work is resumed in the early months of 1915, manufacturers will continue to produce the cars they were offering during 1914. The new types which should have been presented in the Grand Palais this month will be put forth as 1916 models. It hardly is necessary to state that there will be no show in Paris before the end of 1915. Even England, which is much better placed than France, owing to the absence of conscription, has decided to drop its motor show this year. Already 1915 is looked upon as a dead year, or a go-between year. Trade may spring up briskly after the war—business men are divided on this point—but there will be so much reorganization to do, there will be so much time lost in getting supplies, there will be so much delay in settling down to the old routine, that 1915 cannot under any circumstances be a brilliant year. Most men in the industry are of the opinion that there will be a period of retrenchment which will last fully a year

after the declaration of peace on this side of the Atlantic.

One complicated phase of the situation is that the government has become the owner of probably more than half the cars in France. No figures are available on this point, but from the opportunities I have had of noting the number of cars with the French armies and in army garages in various parts of the country, I am of the opinion that the state has purchased fully 70 per cent of all machines above 12 horsepower. The army does not need all these machines on a peace footing—indeed there are thousands at the present time kept in reserve owing to the inability to use them with the troops—and when hostilities come to a close they must be disposed of. There will be a considerable wastage.

Already the country side is dotted with wrecked cars. Further, there will be hundreds of cars which cannot go into private service until they have received a complete overhaul. Whether the damaged machines will be scrapped and the good ones kept, whether the army will keep them all, or whether it will sell them back to the original owners at a reduced price, is not known. The probabilities are that the last mentioned plan will be adopted. It remains to be seen whether the recuperating powers of the French nation are sufficient for it to replace its shortened supply of motor cars immediately or not.

It may be taken that there will be an absolute refusal on the part of both France and England to accept any German motor products for a long time after this war. This already is felt in England; it is not felt in France for the moment because France is not a buyer. No Frenchman or Englishman will want to own a German car, to use German tires, or to have on his car any German part if it can be produced elsewhere.

### Strong Feeling Against Germans

At the present time there are no German companies in France. The government stepped in and requisitioned all the Continental tires; it has taken possession of the Bosch factory in Paris; it has seized all German cars, and if there is any German business man in France at this time he must be in some position inaccessible to the police.

In England conditions are different; but even there the feeling is so strong that owners of German names are making frantic efforts to have them changed at the shortest possible notice and firms with German connections and German capital are trying to purify themselves in the eyes



of John Bull. German trade does not need capturing; it is being thrown into the hands of British and French manufacturers.

The most important feature of this business war is the magneto supply. Germany has made such advances in this connection that it has captured 90 per cent of the magneto business in France and England. It is unanimously conceded that the two countries ought to get this business back. France is too busy driving the enemy out of its territory to trouble about this matter; but even England does not appear to be handling the matter in as broad a manner as it justifies. The British Thomson-Houston Co. has decided to go into the magneto business, Vandervelt and a few others are doing the same, but the efforts are timid ones. There appears to be an opening here for American manufacturers. French and English engineers with whom I have spoken admit that there are American magnetos equal to any produced in Europe. In England it is considered that the Rushmore-Bosch combination will meet the shortage of German-made Bosch magnetos.

France and England are experiencing no shortage of gasoline. The average retail price in Paris is only about 1 cent per gallon higher than it was before the outbreak of war. This slight increase is due in all cases to the extra cost of cartage or to the lessened demand. Retailers get a bonus on quantities; private sales not being as brisk as formerly, they are not buying to the same advantage and consequently have to sell at a slightly higher price.

In England the price of gasoline has gone back to normal rates, and there, as in France, there is no possibility of a shortage. The British army on the continent is importing from England all of its gasoline supply and never has experienced the least shortage. It is believed, on the other hand, that Germany's stock of gasoline is running low. If this is so, it will have an enormous influence on military operations. War without gasoline is an impossibility.

#### RENE PETARD HEARD FROM

Racine, Wis., Oct. 10—Captain William Mitchell Lewis, president of the L. P. C. Motor Co., Racine, Wis., has received a letter from Captain Rene Petard, vice-president and chief engineer of the company, who at the outbreak of the European war was in western Europe testing out the Lewis VI and called to service in the engineering corps of the French army, in which he is a captain. The letter was forwarded from Paris by Mrs. Petard and stated that Captain Petard had been on the firing line for 7 days at the battle of the Marne. When Captain Petard wrote, on September 15, the retreat of the Germans from the outer fortifications of Paris had begun and the battle line was beginning to form along the Aisne. "The fighting is constant, terrific and beyond description," says Captain Petard.

## War Abroad Through American Eyes

### Packard Man Tells His Personal Experiences

NEW YORK, Oct. 12—J. R. Clarke, recently connected with the Packard company in Paris, France, has returned to this country after serving nearly 1 month as driver of a Packard car in the service of the signal department of the allies' army. During 18 days of service of this capacity he had an opportunity of observing many of the conditions that motor trucks and passenger cars are confronted with in the war work.

Fully 90 per cent of all the passenger cars are being used in Red Cross work. These cars are suffering from lack of drivers. Frequently taxicab drivers are placed on high-powered cars with which they are not familiar and accidents are frequent. Many of these taxicab drivers do not know the care such a car should receive, and consequently there are many cars destroyed through sheer carelessness.

There is much danger connected with driving cars in any service, largely because the lights are put out in the city streets and at points along country roads for safety purposes. Drivers are not allowed to use headlights and as there is practically as much driving done at night as in the daytime there are many cars destroyed. Many Ford cars are at present being used in the ambulance service. When war broke out a number were requisitioned by the government and at that time the company started to equip a number of chassis with ambulance bodies, which are proving satisfactory.

Mr. Clarke had an opportunity of observing the work of the motor truck convoys in the transportation of ammunition and supplies. At times from 150 to 300 trucks are run in convoys, successive trucks being about 50 yards apart. They travel generally at 15 miles per hour and keep on the regular roads, there being such a network of these that it is not necessary to do any cross-field work.

At present the English army is losing approximately 100 trucks a week and the French army an equal number, due to the average destruction which occurs. For example, a truck halts at the roadside to make some repair and if the driver leaves it there is a danger of the drivers of other vehicles stealing magnetos, carbureters, or other spares which they require. Because of this many trucks are eventually destroyed for minor troubles.

The broadest use of motor trucks for the different armies is from what is known as railhead, which means the end of the railroad system in use, to within a short distance of the firing line, in fact, provision wagons are operating right up to the trenches in some places and Red Cross vehicles also are working right to the firing line.

The Goodrich tire factory in Paris is

being operated by the government, which is manufacturing solid rubber tires for trucks. Practically all of the other factories in France are being operated by the army, but in many the output is very restricted, because of lack of material.

The car dealer business in Paris is at a standstill. The salesrooms are closed, and all are being used for Red Cross work.

At present ten Packard cars are being used in service of the American hospital and Red Cross work.

#### U. S. NEEDS ARMORED CARS

Washington, D. C., Oct. 10—According to information gleaned from army officers and members of congress, the next military appropriation bill will carry a paragraph setting aside \$200,000 for the purchase of a certain number of armored cars for the use of American troops. Sentiment for such an appropriation has developed in congress with surprising rapidity since the European dispatches began to tell of the extraordinary efficiency of armored cars in the present conflict abroad.

It is pointed out that today the United States is the only great world power which has no armored cars in its military equipment. Europeans have recognized their theoretic value for the past 2 or 3 years and the conclusions which they have reached in time of peace have been more than verified by the events of the war.

Representative Anthony, of Kansas, as previously reported in these columns, has announced he will shortly introduce a bill for the purchase of armored cars for the war department. He is convinced that there is more than enough sentiment in congress to pass his bill through both houses. His opinion of the necessity of acquiring this equipment for the troops is backed up by the expert opinion of many army officers.

An army officer who does not wish his name to be used at this time, in discussing the subject said: "It is the opinion of many authorities on this subject that it is high time for this government to begin developing the possibilities of the armored car. It seems only reasonable that as the motor car is developed more and more, all food and other supplies will be transported by means of that vehicle. And, by the same token, it seems safe to assume that an attempt will be made to have all these cars armored as thoroughly as possible. Therefore, it does seem that the United States cannot afford to lag behind any longer."

#### KNIGHT SAILS FOR U. S.

New York, Oct. 12—A letter received today from Charles Y. Knight announces the sleeve-valve motor inventor sailed for this country Saturday. Mr. Knight stated that the war office has just called into service 900 motor buses that have been running on the London streets.



PARIS MOTOR BUSES IN ACTIVE SERVICE. PHOTOGRAPH TAKEN NEAR THE FIGHTING LINE DURING THE BATTLE OF THE AISNE

## Boillot Ditched Driving Officers

### European Champion in Accident En Route to Front

PARIS, Oct. 1—According to reports received from the front, Georges Boillot has been involved in a serious accident while on active service. The French race driver was traveling at a high rate of speed, with three staff officers in his car, when he ran off the road at a bend in an attempt to avoid a car coming in the opposite direction. All the occupants of the car were thrown out, two of the officers being rendered unconscious, but their injuries were not of a serious nature.

Boillot was uninjured, although his car was so completely wrecked that it had to be abandoned. He resumed service with another car. Although Boillot is attached to the headquarters staff, he is not driving General Joffre. The head of the French army moves about comparatively little; when he does travel it is by motor car with one of his staff officers at the wheel.

Jules Goux, who went into one of the forts at Belfort on the outbreak of war, has been transferred to the motor section, and now is driving officers in a Peugeot car. Louis Wagner, who finished second for Mercedes in the last French grand prix, has not been allowed to enter either the motor car or the aviation section of the French army. He is serving as an artillery man on the eastern frontier. The refusal to allow Wagner to serve in the branches in which he has so distinguished himself, is doubtless due to his recent connection with the German firm. Wagner is purely of French origin, and does not even speak a word of German. But in such times as the present the army will not take any risks, and all men who have had recent connections with German firms are put into unimportant posts.

News of motorists at the front is very

scarce. This war is absolutely anonymous; no names are mentioned in dispatches, and when men are killed or wounded only their nearest relatives are privately informed. No lists are published in the newspapers or elsewhere. Men writing home are not allowed to state where they are stationed, or where they are going to. In consequence of this state of affairs it will only be possible to know after the war whether men in whom the motoring public is interested are alive or dead.

### ELECTRIC SESSION NEXT WEEK

Philadelphia, Pa., Oct. 10—On next Monday, Tuesday and Wednesday, October 19, 20 and 21, the annual convention of the Electric Vehicle Association will be held in Philadelphia and present indications presage the most important gathering of its kind ever held.

A vast amount of work, liberally punctuated with pleasure, has been mapped out for the visiting delegates, from which not only those directly concerned will benefit, but the average business man will derive many valuable pointers on the advantages of the electric vehicle and its application to transportation problems.

Makers of electric vehicles, producers of parts and supplies, manufacturers of storage batteries, tire makers and distributors of current will be represented by delegates from all sections of the country, several of whom are expected to make the trip to this city on electric cars.

The Bellevue-Stratford will be the headquarters, and during the sessions an exhibition of electric specialties and moving pictures illustrating the sale of electric trucks will be two of the striking features. The assignment of speakers and the papers they

will read show a wealth of material presenting new viewpoints of problems of growing importance to the electric industry as the latter enlarges its scope.

Mayor Blankenburg will welcome the delegates on Monday morning, immediately following which the business session will begin. Such subjects as insurance, operating records, legislation, garages and rates, educational courses, standardization, traffic, good roads and central station cooperation will be presented during the day. Two papers to be read will be one by J. A. McGraw on "Progress of the Electric Vehicle," and one by W. P. Kennedy on "Electric Vehicles in Parcel Post Service."

Tuesday's subjects include: "Electric Vehicle Performance," R. B. Grove; "Effects from the Utilization of the Kinetic Energy of an Electric Vehicle," T. H. Schoepf; "Wider Dissemination of Electric Vehicle Information," T. F. Jones; "Calculations of Electric Motor Characteristics and Prediction of Vehicle Performances," A. A. Nims; "Educating the Public in the Field and Use of the Electric Vehicle," F. C. Henderschott; "Power Wagon Operation in Central Station Service," W. A. Mainwaring; "Electric Fire Apparatus," Chief G. A. Walker.

Wednesday's papers include: "Design and Performance of Electric Vehicle Motors," H. S. Baldwin; "Cost of Electric Vehicles," G. H. Kelly; "European Development of the Electric Vehicle Industry," P. D. Wagoner; "Constant Potential Systems for Charging from Motor Generators," H. P. Hodge, and the "Motor Truck in Traffic Congestion," Lieutenant of Police W. D. Mills.

Manufacturers present on Wednesday also will be invited to participate in an open discussion on the "Electric Industrial Truck." Numerous trips to historical points will be a diversion.

### RECEIVER FOR EFFICIENCY SURVEY

Chicago, Oct. 13—An involuntary petition in bankruptcy was filed in the United States district court, Judge Landis presiding, yesterday against the American Efficiency Survey of Motor Car Units, a corporation formed for the purpose of making tests of various motor car parts and accessories. The liabilities of the concern are said to be in excess of \$60,000. Attorney Raymond Visser will not give out any definite statement until the creditors have been examined.

The Central Trust Co. of this city has been made receiver and the assets, according to the attorney for the petitioning creditors, consists of office furniture in the twelve-office suite on Michigan boulevard.

The American Efficiency Survey of Motor Car Units came into prominence 6 months ago when its president, Harry Newman, announced that day and night tests were being conducted at the testing laboratories of Purdue university with a view to advising motor car manufacturers as to the merits and demerits of their products.



# Cole Four Given Official Fuel Test

## Average of 22.465 Miles to Gallon Made

INDIANAPOLIS, Ind., Oct. 9—Under the supervision of the American Automobile Association a Cole standard four was put through six fuel economy trials and a speed trial on the speedway yesterday and today, averaging 22.465 miles per gallon of fuel for the six trials and 55.63 miles per hour in the speed test. The highest fuel average made was 24.426 miles per gallon accomplished in the fifth trial held this morning and the next best, 24.135 miles per gallon on the sixth trial. The sixth trial showed a ton-mileage of 53.

### Object of the Tests

The object of the tests, which were official and which were handled by American Automobile Association representatives, was to determine the fuel economy of the four-cylinder Cole, with and without hot air connection to the carbureter, with pressure, gravity and vacuum feed and with various passenger loads. The car used in this test was a four-cylinder series 11-4 with a bore and stroke of 4¼ by 5¼, equipped with a Stromberg H2 carbureter, 1¼-inch size. Silvertown cord tires, 34 by 4 all around and Delco starting, lighting and ignition units. The car weight is given as 3,280 pounds without passengers.

In order to be able to use either pressure gravity or vacuum feed a separate 5-quart tank was carried, the main tank at the rear being disconnected. The test tank was provided with connections so that it could be used for the different systems of feeding. For gravity a measured 1-gallon tank was poured into the tank and the latter fastened to the left windshield bracket. For pressure feed the same tank was placed on the running board and a hand pump used to force air into the tank. For vacuum feed the tank was left on the running board but the feed was through a Stewart vacuum tank behind the dash of the car. The top and windshield were up for all trials.

Yesterday four fuel economy trials were held, the first starting at 11:20 a. m. when the thermometer showed 81 degrees. The feed to the carbureter was by gravity and

the Cole, driven by Chief Engineer Charles Crawford and accompanied by one passenger ran out of fuel after completing 22.496 miles. No hot air connection was fitted to the carbureter.

The average speed was 23.20 miles per hour. The fuel used was purchased of the Crescent Oil Co. is known as Coalene, and was of 67 degrees Baume. This fuel was used in all of Thursday's trials. On the first trial the car weighed 3,586 pounds complete.

On the second trial a standard gallon of fuel was fed to the carbureter under 2½ pounds pressure and during this trial the weather was very unsettled, a shower and a severe drop in temperature coming in the second half. At the start of this trial the thermometer showed 81 degrees, and at the finish 74. That the motor was affected by this is evident by the Motometer readings which varied from 100 at the start at 12:40 p. m. to 115 at 1:05 p. m. to 100 at 1:10 p. m. and 110 at the finish. The run was made with the driver and one passenger and the engine stopped for lack of fuel at 20.844 miles after traveling at the rate of 23.38 miles per hour. The drop in mileage per gallon may be directly attributed to the varying temperatures. No hot air connection was used.

### Vacuum System Trial

The third trial was made with the carbureter fed from the tank by the Stewart vacuum system. No hot air connection was used and with one passenger and the driver, the car completed 22.028 miles on 1 gallon of gasoline, the speed of the car being 22.1 miles per hour. The temperature was slightly higher on this trial, being 90 degrees at the start and 82 at the finish, and the motometer showed 110 degrees at both start and finish due to the settled weather following the shower.

The fourth and last trial of the day was made with seven passengers in the car, giving a total weight of vehicle and passengers of 4,350 pounds. No hot air connection was used and the fuel was fed to the carbureter by the vacuum system. The

Cole went around the speedway for 20.862 miles before the measured 1 gallon was exhausted and the speed for the trial was 23.40 miles per hour. Owing to the time of the day, 3:53 p. m., there was a considerable drop in temperature. At the start this was 80 and at the finish 72.

### Trials with Hot Air Pipe

Two economy trials with hot air connections to the carbureter and one speed trial were held today and in all three events gasoline of 61 degrees Baume was used. The car was equipped as in yesterday's events and the runs made with top and windshield down.

The first trial was made at 10:10 a. m. with the carbureter fed by the vacuum system and fitted with a hot air tube leading from a stove on the exhaust manifold to the carbureter. Two passengers were in the car, including Driver Crawford, who piloted the Cole for 24.426 miles at a rate of 24.55 miles per hour, before the 1 gallon of fuel was exhausted. The car weighed 3,650 pounds, the added weight being due to a supply of gasoline taken on for use in succeeding tests. A heavy shower caused various changes in the registrations of the Motometer. At the start of the run it showed 120 degrees; at 10:32, 140 degrees; at 10:45, 120, and at the finish, 110 degrees. The air temperature was 70 degrees at both start and finish.

The last fuel-economy run was made with the same fittings as in the previous one, but there were seven passengers in the car. The weather was by far the most favorable of the day and the 1 gallon of fuel gave out at 24.135 miles, the car having traveled at the rate of 24.75 miles per hour. The total weight of the car with passengers was 4,390 pounds and the air temperature was 72 at the start and 71 at the finish. There were, however, greater variations in the Motometer readings, the start showing 150 and the finish 135.

The last event was the ½-hour speed trial in which Lew Pettijohn, the driver, the only one in the car, drove it at the rate of 55.63 miles per hour for 30 minutes. The car was given a flying start and eleven laps of the speedway were covered, the total distance for the half hour being 27.815 miles. A feature of this trial was the consistency of the car, as may be seen

RESULTS OF FUEL-ECONOMY AND SPEED TRIALS OF FOUR-CYLINDER COLE ON SPEEDWAY

	No. 1 2 persons	No. 2 2 persons	No. 3 2 persons	No. 4 7 persons	No. 5 2 persons	No. 6 7 persons	No. 7 30 min. speed trial Driver only
Time of start.....	11:20 a. m.	12:40 p. m.	2:25 p. m.	3:53 p. m.	10:10 a. m.	12:05 p. m.	Time Lap time
Fuel feed .....	Gravity	Pressure	Vacuum	Vacuum	Vacuum	Vacuum	Miles
Miles .....	22.496	20.844	22.028	20.862	24.426	24.135	20:43:13
Time .....	58:07:8	53:30:0	59:45:0	53:31:0	60:15:4	58:20:0	2:41:80
Miles per hour.....	23.20	23.38	22.10	23.40	24.55	24.75	23:24:84
Weight with passenger .....	3,586	3,586	3,586	4,350	3,650	4,390	26:08:80
Ton miles per gallon.....	40.35	37.35	39.50	44.50	44.6	53	28:48:60
Temp. .... { Start .....	81	81	90	80	70	72	31:31:78
{ Finish .....	81	74	82	72	70	71	2:43:18*
Motometer .... { Start .....	110	100	110	110	120	150	36:55:98
{ Finish .....	115	115 at 1:05	110	90	140 at 10:32	140 at 12:17	39:36:88
		100 at 1:10			120 at 10:45	140 at 12:47	42:18:83
		110 at fin.			110 at fin.	135 at fin.	25
							44:59:13
							27½
							47:40:85
							30
							50:22:65

Average m.p.h., 55.63  
Miles, 27.815 per ½ hour

\* Rate 55.2 m.p.h., all other laps 55.6 m.p.h.



from the table herewith. During this trial the fuel was fed to the carburetor by pressure from the regular rear tank.

#### MAXWELL SHOWS BIG PROFIT

Detroit, Mich., Oct. 10—During the business year ending July 31, 1914, the Maxwell Motor Co., earned a net profit of \$1,505,469.09. Notwithstanding this big profit and the fact that the annual dividend requirements on the first preferred stock amount to only \$859,553 no dividends have been declared and the whole amount will be used for the extension and development of the business.

In the course of his statement to the stockholders, President Walter E. Flanders says: "The net working assets of approximately \$6,000,000 of which over \$1,500,000 in cash, place the company in a strong position. Although the net earnings of the company, as shown by the certified public accountants amount to more than \$1,500,000, as against the annual dividend requirements on the first preferred stock of \$859,553, the management has deemed it advisable to conserve the liquid assets of the company for the development and extension of its business. Therefore no dividends have been declared."

The net earnings for the year were \$1,430,444.52, while other income from various sources totaled \$339,979.02, bringing the general total to \$1,770,423.54. After deducting various charges the net profit for the year amounted to \$1,505,469.09.

#### MANY CARS SOLD AT ST. LOUIS

St. Louis, Mo., Oct. 12—The eighth annual show of the St. Louis Manufacturers and Dealers' Association closed at midnight Sunday night and was the most successful in the history of the organization, being held 1 day beyond the time scheduled for its closing. During the week, more than \$500,000 worth of cars were contracted for, Show Manager Lee estimating the value of the sales, including twelve commercial vehicles, at \$570,000. Four hundred and sixty passenger cars were sold. The success of the show was due to the showing of 1915 models almost 3 months in advance of the other cities. The committee in charge already has set the date for next year's exhibition, which will be held the first week in October, at Forest Park highlands, the scene of this year's show.

#### CINCINNATI HOLDS BIG SHOW

Cincinnati, O., Oct. 10—The first fall show held in Cincinnati came to a close this evening. The exhibition was run under the auspices of the Cincinnati Automobile Dealers' Association and was a big success. The attendance was a record-breaker and many sales were reported. The show was held in Music hall. All 1915 models of the larger manufacturers were on display. The business outlook in this territory is exceptionally bright.

## National Show Allotments Are Made New York and Chicago Each Has 550 Exhibitors

NEW YORK, Oct. 10—The drawing for space in the two national shows, New York and Chicago, which took place Thursday and which brought out representatives of eighty-seven of the ninety-two members of the National Automobile Chamber of Commerce, disclosed the fact that there will be approximately 550 exhibitors at each of the displays.

In the drawing for space the first choice fell to the Overland car, followed by Studebaker, Buick, Cadillac, Chalmers, Hudson, Packard, Maxwell, Hupp, Reo, Oakland, Pierce, Paige-Detroit, White, Jeffery, Cole and Locomobile.

The drawing showed that the past year has seen little or no increase in the number of manufacturers, the cars represented at the drawing being old timers in the motor car field.

Wilfred C. Leland, vice-president of the chamber, presided and the names of those present included almost every motor car maker of prominence in America.

S. A. Miles, manager of the shows, reported that applications for the fifteenth annual exhibitions exceeded in number those for any previous affairs of the kind, it being impossible to provide for seven of the car applications received for the Chicago show.

There was much gratification among the makers over the action of the senate committee at Washington in recognizing the importance of the industry as evidenced by their decision not to place a tax on motor cars, which are already so heavily taxed throughout the country, including registration fees, taxes to operate vehicles, personal property tax, wheel tax, road improvement tax, and in the case of North Carolina, \$500 license fee to sell cars in the state.

There were the usual reports of the various committees that are carrying on the active work of the chamber for the betterment of the industry and for the 1,400,000 owners of motor cars throughout the country.

The show in the Grand Central Palace in New York city will take place January 2-9, and in the Coliseum and First Regiment Armory, Chicago, January 23-30, inclusive. The following members of the N. A. C. C. have been allotted space at both shows:

Abbott, Apperson, Auburn, Austin, Briggs, Briscoe, Buick, Cadillac, Cartecar, Case, Chalmers, Chandler, Cole, Cunningham, Dodge, Flat, Franklin, Garford, Haynes, Hudson, Hupmobile, Imperial, Inter-State, Jackson, Jeffery, King, Kissel, Krit, Locomobile, Lozier, Lyons-Atlas, McFarland, Marion, Marmon, Maxwell, Mercer, Mitchell, Moline, Moon, National, Oakland, Olds, mobile, Overland, Packard, Paige-Detroit, Pathfinder, Peerless, Pierce-Arrow, Premier, Pullman, Regal, Reo, Saxon, Speedwell, Stearns, Stevens-Duryea, Studebaker, Stutz, Velle, Westcott, White, Winton.

The Kline car will be exhibited at the New York show only.

The following manufacturers who are

not members of the National Automobile Chamber of Commerce will exhibit at both the New York and Chicago shows:

Allen, American Cyclecar, Argo, Cresson-Morris, Crow, Davis, Durant Dort, Enger, Herff-Brooks, Herreshoff, L. P. C., Lexington, McIntyre, Metz, Monarch, Milburn, Paterson, Partin-Palmer, Remington, Sphinx, Scripps-Booth, Twombly.

The following, made up of non-members of the N. A. C. C., are on the list for the New York show only: Pilot, Fischer, Grant, Crawford and Owen.

The following non-members of the N. A. C. C. will exhibit at Chicago only: Bartholomew, Buckeye, Elkhart, Empire, and Cowles-MacDowell. The waiting list for Chicago includes Frederickson, Grant, Ogren and others.

At a meeting of the show and allotment committee of the Motor and Accessory Manufacturers the allotment of space to association members was completed for the shows.

While the number of exhibitors is slightly decreased, the area of space assignment at both shows was considerably greater than heretofore. The following association members were assigned space at both New York and Chicago shows:

American Bronze Co., Apple Electric Co., Automobile Supply Mfg. Co., The Badger Brass Mfg. Co., The Bearing Co. of America, Benford Mfg. Co., John W. Blackledge Mfg. Co., The Bock Bearing Co., William H. Brown, Brown-Lipe-Chapin Co., Brown-Lipe-Gear Co., Byrne Kingston & Co., P. S. Carr Co., Champion Ignition Co., C. Cowles & Co., The Cramp & Sons Ship & Engine Bldg. Co., Detroit Lubricator Co., Joseph Dixon Crucible Co., Doehler Die-Casting Co., Double Fabric Tire Co., Dunlop Wire Wheel Corp., John L. G. Dykes, Dyneto Electric Co., The Electric Storage Battery Co., Finklensen & Kropf Mfg. Co., Gabriel Horn Mfg. Co., Garage Equipment Mfg. Co., The Garford Mfg. Co., Gemmer-Detroit Starter Co., The Globe Machine & Stamping Co., Golde-Patent Mfg. Co., Gray & Davis, L. P. Halladay, A. W. Harris Oil Co., Hartford Suspension Co., Robert H. Hassler, The Heinze Electric Co., The Hoffecker Co., International Acheson Graphite Co., J. M. Shock Absorber Co., Kellogg Mfg. Co., Atwater Kent Mfg. Works, Kokomo Electric Co., Leather Tire Goods Co., Lovell-McConnell Mfg. Co., A. R. Mosler & Co., Molsinger Device Mfg. Co., National Screw and Tack Co., National Tube Co., N. Y. & N. J. Lubricant Co., North East Electric Co., The Pantasote Co., Pittsburgh Model Engine Co., Randall-Falchney Co., Rose Mfg. Co., Royal Equipment Co., J. H. Sager Co., A. Shrader's Son (Inc.), Schwarz Wheel Co., C. A. Shaler Co., Sparks-Withington Co., Spicer Mfg. Co., Splittdorf Electrical Co., Standard Thermometer Co., Stewart-Warner Speedometer Corp., Stromberg Motor Devices Co., Taylor Instrument Co. (Motometer Co.), United States Light and Heating Co., Vacuum Oil Co., Valentine & Co., Van Sicklen Co., Veeder Mfg. Co., Voorhees Rubber Mfg. Co., Waltham Watch Co., Warner Gear Co., Westinghouse Electric and Mfg. Co., Wheeler & Schebler, Willard Storage Battery Co.

The members of the association exhibiting at the New York show only are:

Bosch Magneto Co., Edward G. Budd Mfg. Co., Coes Wrench Co., English & Mersick Co., Hartford Machine Screw Co., George A. Haws, Herz & Co., Light Mfg. and Foundry Co., Manufacturers' Foundry Co., Perfection Spring Co., Sloan & Chase Mfg. Co. (Motor Compressor Co.), Springfield Metal Body Co., The Standard Welding Co., Ward Leonard Electric Co., The White & Bagley Co.

The members of the M. & A. M. who have taken space at the Chicago show only are:

Buda Co., Continental Motor Mfg. Co., Edison Storage Battery Co., C. T. Ham Mfg. Co., Imperial Brass Mfg. Co., National Coll. Co., Ramy Electric Co., Sulzberger & Sons Co., Vesta Accumulator Co., Warner Mfg. Co.

# Cherry Circle Wins Fall Inter-Club Team Match

## Chicago Automobile Club Beaten in 1-Day Reliability



CHICAGO TEAM MATCH CARS PARKED AT GEORGE ADE'S FARM

By C. G. Sinsabaugh

CHICAGO, Oct. 12—As proving the popularity of interclub team matches, fifty-eight cars contested in the fall run between the Chicago Automobile Club and the Chicago Athletic Association on Saturday. Of this number, thirty-five carried the C. A. C. colors, while twenty-three ran for the Cherry Circle. In addition there were eight official cars, making one of the most imposing motorcades that ever went out of Chicago.

The match proper was won by the Chicago Athletic Association with a score of 177 demerits, as against 244 for the losers. This carried with it the Allen S. Ray cup. But the Automobile club saved something out of the wreck by lifting the Carelton White cup, given for the greatest number of perfect scores, the C. A. C. having twenty-nine, as against sixteen for the C. A. A. Under the system of scoring each team was given 5 points credit for each perfect score, so that while the C. A. A. actually had 262 black marks, the 85 points credit for the perfect scores reduced this count to 177. The C. A. C., having the larger team, was penalized only twenty-three thirty-fifths of a point, which, with its perfect-score credits, reduced its penalty from 522 to 244. For each car scratched there was a 5-point penalty, the C. A. A. losing only one car this way, while the C. A. C. lost two cars, one of which was to have been driven by Bob Burman.

The run was a 1-day affair, going to George Ade's farm at Brook, Ind., for the noon stop, a distance of 95 miles. The novelist was a most genial host and aided by the Daughters of Ruth, a church society, cared for his 250 visitors in a most hospitable manner. The afternoon run

was 82 miles in length, finishing at the South Shore Country Club, where the losing team paid for the dinners.

The day was not the best that could be desired from a weather viewpoint, for it rained almost continuously. There was a letup for an hour or so at noon while the motorists were at Ade's, which really saved the day. But the weather did not dampen the enthusiasm of the clubmen and, as noted above, only four cars were scratched, and those not because of the rain.

A feature of the match was the competition of Ralph de Palma and Joe Dawson, the race drivers, who are members of the Chicago Automobile Club. Both made perfect scores, de Palma driving a Chandler and Dawson a Marmon. This was Dawson's first appearance behind the wheel since his accident at Indianapolis.

Forty-five of the fifty-eight cars made perfect scores, penalties being exacted only for work done and for being late at controls. Three failed to finish and in each case there was a penalty of 250 points given. Forrester in a Packard was put out when another car punched a hole in Forrester's gasoline tank. Summaries:

CHICAGO AUTOMOBILE CLUB		
No.	Driver and Car	Penal- Credits
1	H. Vissering, Pierce-Arrow	5
3	Michael Zimmer, Oldsmobile	5
5	A. N. Eastman, Mitchell	5
7	J. T. Brown, Moline-Knight	5
9	Otis B. Duncan, Falcar	5
11	George F. Kelly, Cole	5
13	John Kercher, Jeffery	5
15	A. H. Pearsall, Studebaker	5
17	A. M. Robbins, Jeffery	5
19	E. A. Turner, Mercer	5
21	Joseph Dawson, Marmon	5
23	E. G. Watrous, Staver	5
25	William H. Rankin, Cole	250
27	W. E. Stalnaker, Premier	5
29	James H. Murray, Cadillac	5
31	Ralph de Palma, Chandler	5
33	Herman W. Mersbach, Packard	5
35	Thomas J. Hay, Hupmobile	5



S. E. HIBBEN, CAPTAIN OF WINNING C. A. A. TEAM

37	George F. Ballou, Apperson	5
39	J. W. McCausland, Stevens-Duryea	4
41	C. R. T. Forrester, Packard	250
43	F. L. Beck, Paige-Detroit	5
45	V. E. Ortlund, Abbott-Detroit	5
47	F. H. Sanders, Franklin	5
49	J. L. McLaren, Hudson	5
51	L. C. Erbes, L. C. E.	1
53	W. G. Leininger, Palmer-Singer	5
55	F. W. Wolf, Hudson	5
57	J. E. Duffield, Cutting	5
59	A. A. Landry, Stutz	5
61	W. M. Gelderman, Pathfinder	5
63	Bob Burman, Chalmers	5
65	D. J. Canary, Chalmers	1
67	W. D. Morris, Winton	5
69	A. C. Fordham, Buick	5
71	F. J. Robinson, Mercer	5
73	H. W. Sehl, Norwalk	1
75	J. W. Maguire, Midland	5
Total gross		522
Net gross		244

CHICAGO ATHLETIC ASSOCIATION		
No.	Driver and Car	Penal- Credits
2	F. W. Wentworth, Packard	5
4	Henry Bosch, Jr., Stearns	1
6	C. T. Knisely, Diamond T.	5
8	J. W. Hirst, Speedwell	3
10	R. W. Tansill, Pierce-Arrow	5
12	A. Holman, Packard	5



14—Clifford Ireland, Hudson.....	5
16—A. J. Banta, Locomobile.....	1
18—W. W. Harlass, Packard.....	5
20—Guy Osborn, Marmon.....	5
22—W. G. Tennant, National.....	5
24—W. A. Pope, Winton.....	5
26—A. C. Ortmeier, National.....	5
28—F. E. Pfannmuller, Cadillac.....	1
30—Sidney Smith, Chalmers.....	5
32—F. H. Judd, Knox.....	5
34—R. H. Adams, Winton.....	5
36—J. N. Rawleigh, Stearns.....	1
38—Daniel Ray, Stearns.....	5
40—Alfred Hill, Packard.....	5
42—F. X. Mudd, Lozier.....	5
44—P. B. Hosmer, Hudson.....	250
46—L. T. Jacques, Peerless.....	5
48—S. E. Hibben, Packard.....	5
Total gross.....	262
Net gross.....	85
Credit of 5 points for each perfect score was given. Star denotes scratch.	85

### FRANKLIN A WINNER AT ST. LOUIS

St. Louis, Mo., Oct. 12—In the seventh annual reliability run of the Automobile Club of St. Louis Saturday, W. J. Lother,



GEORGE ADE, THE NOVELIST, WHO ENTERTAINED CHICAGO MOTORISTS

driving a Franklin, finished first in the touring class with 4 points penalization, and C. M. Barnard, at the wheel of a Mitchell, captured the honors in the roadster division, with the only perfect score of the day.

The run was held over the St. Louis streets and the roads of St. Louis county, which were in poor condition because of recent rains. The route measured 126.4 miles. There were seven checking stations.

Two women drivers participated, Mrs. H. F. Johansen finishing fifth in the roadster class with a Stutz, and Mrs. H. Conrad finishing third in the touring car division with a Franklin. The former had a score of 959 and the latter a score of 994.

The first five cars to finish in the touring car division were all Franklins driven by C. J. Lother, A. Graf, Mrs. Conrad, Louis Boeger and L. Manne. In the other class, S. J. Pingree, Mercer, was second, with a score of 996, and A. Van Hoefen, Henderson, third, with 995.

### CHAUFFEURS WOULD AMEND LAW

Boston, Mass., Oct. 10—The Massachusetts Automobile Operators' Association, whose headquarters are in Boston, and whose membership is close to 1,500, now is planning to bring before the next legislature some bills that will change the status of chauffeurs. One of the most important is that which classes chauffeurs now as domestic servants, and thereby prevents their becoming beneficiaries under the working men's compensation law. The officers of the association claim they are as much entitled to protection under that law as motormen and other drivers of vehicles on the highways.



RALPH DEPALMA DRIVES CHANDLER TO PERFECT SCORE ON CHICAGO TEAM

Another law they seek to have put through is one that would grant them at least 1 day off in 15. Under the present law they do not come under the class that are given a rest.

The association also is making tests with headlights so as to try to evolve some adequate plan for dimming lights in cities, many of the members having had narrow escapes from time to time, due to the glare. The officials also will try to have something done so that vehicles carrying loads such as iron pipes, and other things that project out 8 or 12 feet or more from the end of the wagon will have the light at night, a red one, fastened to the end of the load instead of under the wagon, and in daytime some piece of cloth, preferably red, tied to the end. There have been accidents due to not noticing the long, thin piping. Other changes also are under consideration.



GEORGE ADE AND HIS NEIGHBORS, DRESSED UP AS "DESPERATE CHARACTERS," READY TO WELCOME CHICAGO MOTORISTS



# Many Commercial Problems Discussed by Truck Men

## Detroit Convention of Great Value to the Industry—Time Payments, Service, Guarantees and Overloading Among Subjects Taken Up

**D**ETROIT, Mich., Oct. 10—Time payment plan for the purchase of motor trucks, the much-mixed problem of proper service, the broad question of the manufacturers' guarantee and a thorough threshing out of the overloading and over-speeding evils were among the more important topics which served to make the first national convention of motor truck dealers, owners and manufacturers, promoted by the Motor Truck Club of America, a signal success.

The convention was opened on Wednesday in the Hotel Cadillac and continued through the 3 following days. All told, more than 300 delegates attended. As an indication of the wide appeal of this, the first real get-together gathering of motor truck interests, it is significant that the attendance was drawn from such widely separated centers as Boston, New York, San Francisco and Canada.

Whether or not this first convention of motor truck interests will be repeated next year, and possibly made an annual event, has not yet been decided, though there appears to be a sentiment among dealers, makers and owners that a furtherance of the convention idea will be of benefit to all. Invitations have been received from San Francisco to hold the 1915 convention, if one is held, in conjunction with the forthcoming Panama-Pacific exposition and also from both the chamber of commerce in Buffalo, N. Y., and its mayor. Further action has been deferred, however, and the matter will be taken up by the governing committee of the Motor Truck Club of America.

### Truck Makers to Organize

As a result of the convention, the feeling that there is a need for a separate organization of motor truck manufacturers crystallized into the formation of a committee of five, which has been empowered to ascertain further the sentiments of makers and to receive applications for membership in a sub-committee of the Motor Truck Club of America; at the same time it has been requested that separate sub-committees be appointed for both makers and users.

The movement to create a separate manufacturers' organization was headed by Walter E. Parker, of the Commerce Motor Car Co., who called a conference of makers during the convention for the purpose of ascertaining their sentiments. Following the conference, in which the sentiment for some sort of a separate organization was uniform, the matter was taken up by the Motor Truck Club of America in session and by a vote of 21 to 20 it was decided to appoint the committee above mentioned. This consists of Chairman D. F.

Poyer, of the D. F. Poyer Co., Menominee, Wis.; B. A. Gramm, Gramm-Bernstein Co., Lima, O.; J. Van Allen, Atterbury Motor Car Co., Buffalo, N. Y.; O. P. Briggs, H. E. Wilcox Co., Minneapolis, Minn.; O. Armleder, O. Armleder Co., Cincinnati, O. John Squires, of the Signal Motor Truck Co., Detroit, Mich., was made secretary of the committee, though not a member of it.

### Scope of Association Undecided

Although sentiment regarding the need for a separate association of truck makers was practically uniform there was little uniformity of opinion regarding the form such an association should take. It was held in general that the formation of a totally separate body was not to be desired for the reason that both the N. A. C. C. and the S. A. E. perform at least in part the functions for which the makers' organization was desired—namely, to permit free and private discussion of makers' problems with a view to their solution. It was felt that such discussion was impossible in a general meeting of manufacturers, dealers and owners of trucks.

The committee which has the matter in hand is to report in 30 days, when further action will be taken.

The principal value of the convention comes from the fact that the problems discussed were intensely practical ones. For the nonce, theory was relegated to the comparative obscurity of the background and those who read papers and took part in the discussions concerned themselves wholly with the live, pulsing problems of the day. Without exception, all of the sessions were well attended and there was apparent an evident desire to take advantage of the opportunity presented for general discussion. The troubles which menaced the dealer in the east were listened to by the western dealer; the southern owner gave freely of his experience that the dealer or the owner from the north might profit therefrom.

Among all the various aspects of the commercial vehicle industry which were considered, it is doubtful if any created more interest, or proved of greater interest, than did the topic of time payments for commercial vehicles. There were two papers on this subject and in both of them it was brought out very forcibly that there exists a genuine need for, first, an exchange of ideas on this vital problem, and, second, a concrete plan of action which may be followed by manufacturers and dealers, alike.

In both of these papers it was made very plain—if such emphasis is needed in the light of what appears to be fairly common knowledge—that it is absolutely essential to the greater success of the com-

mercial vehicle industry that motor trucks be sold on the time payment plan. Little reflection will make plain the fact that credit is the basis of practically all modern business. In almost any line of business the merchant prospers or fails in proportion to the amount of credit he can obtain. It follows that as the merchant desires, and needs, motor vehicles in order that he may increase his business, there is every logical reason why he should be extended credit in the purchase of his equipment.

Although this is not so much the case with the heavy commercial vehicle, it is especially true of the lighter types of delivery wagons for which there is a tremendous field among the smaller merchants who now are compelled, in many cases through lack of a method for buying these vehicles on time, to rely upon horse-drawn vehicles.

In both of the papers presented on this vital problem—one by Walter E. Parker, president of the Commerce Motor Car Co., Detroit, Mich., and the other by F. M. Gregg, of the American Commercial Co., Cleveland, O.—a concrete plan of action was presented; and it is significant of the value of such conventions that the two plans are widely different. Parker, of course, looks upon the question of time payments through the eyes of a manufacturer and Gregg examines the question in the light of long experience as a banker. In passing it also may be stated that Gregg has had considerable experience as a manufacturer—though not of commercial vehicles—as well.

### Parker's Plan for Time Sales

Parker's plan, in brief, is to form an association of manufacturers and dealers, who, he explains, must operate in harmony if success is to be obtained. He proposes that the association be styled the Motor Truck Credit Guaranty Association. The association would have a capital stock of \$500,000, in non-assessable shares of \$100 each, half of which would be subscribed by manufacturers and half by dealers. To become members, dealers would subscribe for five shares and manufacturers for twenty-five shares. This capital would give operating funds for the purchase of notes taken by the association for the purchase of trucks on time payments from dealers. Under the operating plan, trucks would be sold on time payments in the following manner:

Upon delivery to the purchaser, one-fourth of the purchase price must be paid in cash. The balance is to be paid in ten equal monthly installments represented by ten notes bearing interest at 6 per cent and covered by a conditional bill of sale or a chattel mortgage on the truck. The truck must be insured against collision, theft,

fire and all the usual property damages.

The plan proposed by Frank M. Gregg is essentially similar in operation, though it is vitally different in that it contemplates no formal association of manufacturer and dealer. That the dealer and the maker must be linked together, Gregg submits is absolutely essential, though he does not advocate the kind of an association proposed by Parker.

It is unfortunate that the length of the program precluded the possibility of open discussion on this problem, which, it is likely, will be taken up in greater detail at future meetings of the Motor Truck Club of America.

Next to the papers on time payments, those dealing with the manufacturer's guarantee and the service which should be rendered both by the maker and the dealer thereunder, constituted the most important topic.

#### Would Extend Maker's Guarantee

The subject was handled from the manufacturer's standpoint by W. L. Day, of the General Motors Truck Co., Pontiac, Mich., and from the dealer's point of view by J. H. Thompson, of the Thompson Auto Co., Detroit, Mich. The discussion was opened by W. C. Cronkright, of the Dequesne Motor Car Co., Pittsburgh, Pa.

With regard to guarantees, Day expressed the opinion that the standard warranty as outlined by the National Automobile Chamber of Commerce is entirely satisfactory for the customer, though he believed that for moral reasons the term of warranty should be extended somewhat beyond the usual 90 days. That greater extension would not operate harmfully is made plain, in his opinion, by the fact the majority of troubles which nominally are covered by the guarantee make themselves apparent long before the 90 days is up.

The word "service," stated Day, in the second portion of his paper, is one of the most abused in the English language, and it might be stated in passing that Day's opinion is shared alike by nearly every manufacturer and dealer in commercial motor vehicles. Parts which prove defective, he stated, obviously should be replaced at no cost to the purchaser, but no maker or dealer should extend himself in giving service to the extent of furnishing a substitute truck while the truck undergoing repairs is laid up. Day's idea of service, in the fewest possible number of words, is as follows:

"We believe the first service to our customer is to intelligently analyze his haulage problem and not only recommend, but insist on him buying the size and kind of truck that is adapted to his needs—and that will prove the most profitable for him to operate.

"The next service is to see that the truck goes to him in good condition.

"The next service is to see that the man who is to operate the truck is thoroughly instructed in the way to use it, as well as

in the way not to abuse it—to caution him against overloading and overspeeding and also to impress these things on the man who pays the bills."

The whole method of applying guarantees is wrong, in the opinion of Thompson, who examined the matter from the point of view of the dealer, in that it places the greatest expense not on the maker but on his agent. The furnishing of replacement parts, stated Thompson, is right and proper and the maker should shoulder this burden, but, he held, it is not right for the maker to expect that the dealer shall stand the expense of having the part placed in the truck.

In many cases, he pointed out, the part to be replaced is a small one and worth little, whereas its application may require that a whole motor be torn down. These charges, he urges, logically should be absorbed by the manufacturer who guarantees the vehicle. He suggests, however, that if there exists in the mind of the maker a doubt with regard to the equipment of the dealer for making repairs and the consequent charge which should result, the makers at least should be willing to submit a schedule of labor allowances at the cost he figures it would take his experienced mechanics to make the installation.

That the amount of free service extended to purchasers should be strictly limited is Thompson's opinion and he stated that if the dealer is equipped to give the service that is due his customers, then the customers will be willing to pay for it.

This view of the question of service also was taken by all of those who discussed Thompson's paper. W. A. Conant, of the Gould Storage Battery Co., stated that the essence of true service is promptness, by reason of the fact that the most valuable feature of motor trucks is their mobility. He stated that as a general rule the purchaser is quite willing to pay for what service he needs provided only that he can get it quickly. The question of service, in his opinion, revolved rather around the solving of minor problems for the purchaser than around the larger ones. He suggested the advisability of an arrangement between the makers of parts and the truck makers covering the question of service on parts which the manufacturer of the truck does not guarantee.

#### Dealers Should Carry Spare Parts

B. A. Gramm stated that in his opinion the one reason why dealers are not willing to give the service to which their customers are entitled, or cannot afford to do so, is because the dealer does not obtain the list price for his trucks. Another reason why service could not be handled in an intelligent manner by the average dealer was that the dealer in few cases carries an adequate stock of spare parts. The old horse owner, he pointed out, invariably had on hand a spare harness, and it should be the endeavor of the dealer to see that pur-

chasers themselves kept on hand at least a small stock of the more necessary spare parts.

Mr. Geiser, of the Denby company, suggested that as it was service that contributed to the success of Carl Fisher, of Prest-O-Lite fame, so should every dealer endeavor to give that service to which his customers are entitled. To this, Mr. Mansfield, of the Willys-Overland company, made reply that Fisher's success came from his cultivation of the small dealer and his insistence that parts be carried by the small dealer all over the country.

Mansfield advocates that the service on motor trucks should be placed on the same basis as the service for passenger cars. In other words that every dealer be required to carry an adequate stock of spare parts. The Willys-Overland company, he pointed out, insists that every Overland dealer carry in stock parts to the value of \$10 for every car sold.

#### Urges More Easily Removed Units

E. S. Foljambe suggested that the reason for all the wail about improper service was due to the fact that even when an adequate stock of spare parts is carried by the dealer, experienced mechanics are required to make the installations, which not only means that labor charges are high but that the truck is laid up, thus bringing a dead loss on the owner. As a remedy he suggested that every essential element of a truck be made a separate unit held in place by some lever and cam method, so that it would be instantly removable by an ordinary man and a new part as easily substituted for it. To carry out the plan he suggested that owners obtain and keep their own stock of spare units—a motor, or a jackshaft, or a rear axle assembly, etc.

J. C. Millman offered as his opinion that the most effective method of disposing of the service problem is to eliminate the necessity for service; and the best way of bringing about this happy state of affairs, he added, is to educate the owners and the drivers.

Walter E. Parker, of the Commerce company, advocated regular inspection as a means to reduce the necessity for service and pointed out that if it were understood between the dealer and his purchaser that service would be given only on those trucks that were presented for inspection, much of the evil would be eliminated, for the dealer then would be able to indicate wherein the owner or the driver was at fault and so prevent little faults from becoming great ones. He also suggested the possibility of instituting a plan of paying a small premium to drivers by dealers for the vehicles which came into the service station least because of trouble.

The tire question in all of its ramifications furnished much food for discussion. The subject was handled in three papers by S. V. Norton, of the B. F. Goodrich Co., Akron, O., on "Cost and Evils of Overloading and Overspeeding; Roy Harris, of the Firestone Tire and Rubber Co., Ak-





GROUP PICTURE OF SOME OF THE DELEGATES ATTENDING THE CONVENTION

ron, O., on "Proper Load Rating for Truck Tires," and J. E. Hale, of the Goodyear Tire and Rubber Co., Akron, O., on "Standard Tire Sizes." Hale's paper was illustrated by lantern slides, showing the effect of wear upon tires under varying load and overload conditions.

Norton offered as his opinion that the chief cause of overloading comes from the tendency of makers, under the strain of competition, to equip their vehicles with the smallest size tires possible. Not only is this a fact, he stated, but in a great many cases the manufacturers of vehicles are to blame for tire troubles which arise because they permit their chassis to be equipped with bodies which are too heavy. He offered as a solution that makers should insist upon knowing the weight of the body which was to go on a chassis.

#### Causes of Truck Tire Wear

Norton also drew attention to the little known fact that the long overhang, which is a feature in some bodies, results in a powerful leverage which overloads the tires even though the actual weight of the vehicle is within the safe limit. A great deal of the trouble from overloading would be eliminated, he stated, if the term "overloading" were more fully understood by users and greater care taken by them to instruct their drivers, who, in a great many cases, are ignorant of the evils of overloading.

The effect of overspeeding, he pointed out, is much the same in the end as overloading, for it means undue wear. That overspeeding may not always be the fault of the driver, he added, is made plain in many cases by the desire of the owner of the truck to move as much merchandise in a given time as is possible. It is this desire which oftentimes causes him to overlook the evil which he unwittingly encourages.

It is the desire of the tire companies, he stated, to sell mileage and not adjustments, but in order that they may do so, close coöperation between the tire maker

and the truck maker is necessary. It is not so much the money cost of the adjustments to the truck owner which operates against him as it is the loss of time necessary while the adjustments are in progress.

In calling attention to the progress which already has been made in the standardization of truck tire sizes, Hale deprecated the present lack of standardization in load-carrying capacities. In order that some standard table might be drawn up, he stated, his company now has in progress a number of tests to determine the amount of wear upon tires under different loading, but that the tests had not yet been brought to a conclusion. The tires under test are 36 by 4, and up to date, the wear indicates that the mileages obtainable will be as follows:

Tire carrying 900 pounds will give 21,000 miles; tire carrying 1,900 pounds will give 11,900 miles; tire carrying 2,200 pounds will give 9,300 miles, and the tire carrying 2,700 pounds—which is nearly 100 per cent overload—will give 7,800 miles. This applies to tires under what may be termed front wheel conditions.

The particular point made by Harris in his paper was that the existing tables for load-carrying capacities show great differences for different makes and that in not all cases is the capacity proportioned to the diameter of the tires as well as to the cross section.

#### Running in Car Tracks Costly

The discussion which followed the reading of these papers brought out the fact that considerable of the destruction of truck tires is due to the almost universal practice of running in street car tracks. The only remedy for this evil, stated Harris, lies in street improvement. In response to a question put by M. C. Horine, of the Commercial Vehicle, Harris stated that his personal preference was for single tires of large cross section rather than dual tires of smaller section. The larger tires, he stated, permitted better distribution of the load and also better conformation of

the tire to the road with resultant increase in wear.

That the spring suspension of a vehicle must have a certain effect upon tire wear was admitted by Harris, the question having been brought up by David Beecroft. What the effect may be, however, he stated, is an obscure point upon which there is not yet any data.

Closely related to the question of tire wear and tire conservation is the question of overloading, over-rating and overspeeding, and this question was handled in five papers by H. M. Alden, Timken-Detroit Axle Co., Detroit, Mich.; L. C. Freeman, Denby Motor Truck Co., Detroit, Mich.; John Squires, Signal Motor Truck Co., Detroit, Mich.; J. G. Utz, Perfection Spring Co., Cleveland, O., and F. A. Whitten, General Motors Truck Co., Detroit, Mich.

#### Over-rating Bane of Industry

Over capacity, stated Alden, is a necessity, but over-rating is nothing short of a crime; nothing is more harmful to the motor truck industry than over-rating. As an indication of the prevalence of what appears to over-rating, he submitted figures covering the weights and rated capacities of twelve makes of trucks rated at 1½ tons. The weights varied, he stated, from 3,750 to 5,700 pounds. He doubted the practical possibility of rating the capacities of all trucks by an independent board of engineers, but stated that a rule might be established under which each manufacturer would publish one and only one capacity rating for each of his chassis and after deducting the weight of the body that goes on the chassis mark that capacity where the driver can always see it. Such a plan would help to keep over-anxious salesmen from exaggerating the capacity, he added.

Overloading, he stated, can be cured in two ways: Teach the public, which does not know the results of persistent overloading, and fight the man who does know it but continues in his pernicious habit. He suggested the publication of a booklet





AT DETROIT, PROMOTED BY MOTOR TRUCK CLUB OF AMERICA

setting forth in plain language the evil effects of overloading.

Freeman stated that every one agreed on the evils of overloading and overspeeding and suggested that the remedy for the practices lay not in the development of the vehicles themselves but rather in the education of those who operate them either as owners or drivers. The problem, he stated, requires a careful study of human nature with the object of cultivating the interest of drivers in their vehicles. The easiest way to cultivate interest, he stated, is to pay for it, and conversely to make failure cost something.

#### Misstatements Are Damaging

Freeman suggests as a remedy that truck makers and dealers cease making foolish and damaging misstatements regarding the capacities of their vehicles, thus placing the responsibility for the performance of the vehicle squarely where it belongs on the shoulders of the purchaser.

Squires stated that the overloading evil was largely due to the truck itself, which will do overwork for a stated period without showing the effect, whereas horse-drawn equipment cannot be overworked without almost immediate effects. If the load cannot be hauled on high gear, he stated, it is natural for the driver to drop into low gear and pull the truck along somehow. It is true that the dealer occasionally will over-rate a truck, he stated, but the purchaser should know that this is a misstatement for the truth appears in the standard warranty. He offered as his opinion that it is essential to determine on a limited body weight and adhere to this weight.

The particular point brought out in the paper by Whitten was his expression that the load capacity and the body weight allowance should appear not only on the name-plate of the truck but also in the contract, and that as an additional safeguard against over-enthusiastic salesmen there should be in bold-face type, just above the famous "dotted line," a warn-

ing to the purchaser NOT to purchase unless all of the salesman's promises are written into the contract.

The paper by J. G. Utz, while not directly concerned with the overloading and overspeeding problem, nevertheless has a prominent bearing on these two evils for the reason that the springs of the vehicle must in either case sustain the brunt of the damage. This point he brought out very carefully by drawing attention to the fact that the springs are the only part of the truck which absorb energy.

The shifting of heavy loads due to crowned roads has a signal effect upon springs, he stated, and should be carefully guarded against. Similarly, it should be the aim of the driver to keep his vehicle as nearly in the center of a crowned road as possible in order to avoid undue strain on the low side of the vehicle.

The subject of list prices and discounts for quantity was another that drew forth much of an educational value. This subject was handled by M. L. Pulcher, of the Federal Motor Truck Co.

#### Should Adhere to List Price

Pulcher reiterated what is known already with regard to the general meaninglessness of lists and offered as the possible reason for the great differences in the lists of different makers that either the maker was charging more than the truck was worth or that the discount to the dealer was too high. He stated that it was very foolish for any dealer or maker to move a bit from his list price, for the practice made all buyers timid on the general assumption that the price quoted them might not be rock bottom. The ordinary discount to the dealer, he said, is plenty large enough, if the dealer really gets the list price. The truck business, he added, is the hardest in the world, for the reason that we haven't the backbone to ask for what we should get—the list price.

With regard to discounts for quantity orders, he stated that there is no such

thing as a standard discount and cited as an example that whereas one maker allows as high as 50 per cent on even small orders, other makers will not give more than 7½ per cent on orders for 100 trucks. As to offering discounts to consumers, he stated this is impossible for the net result is that service suffers. In this respect he stated that though many dealers were of the opinion that the makers are making a mint of money, such is not the case. Few makers, he said, make a gross profit of 15 per cent and in every case the dealer's profit of 25 per cent allowed him to make considerably more money than the manufacturer.

#### Discount for Cash a Benefit

The sales prices on the list of parts, said Pulcher, should total the cost of the vehicle and recommended that makers allow the same discount on parts as they do on their vehicles. In this respect, he offered as his opinion that the practice of offering 5 per cent discount for cash should be encouraged, for it in turn encourages the prompt payment of bills.

The stock of parts that should be carried by the dealer, he said, should vary with the number of trucks the dealer has in operation and the distance of the dealer from the factory. It is money in the dealer's pocket to carry an adequate stock of parts, he added, and where necessary the dealer might well carry a fairly large stock and if necessary mortgage the stock back to the banks.

#### New Territorial Lines Urged

In a paper entitled, "Territorial Lines for Dealers," T. R. Lippard, of the Stewart Motor Corp., Buffalo, N. Y., suggested that the present plan of attempting to cover the country like the dew is basically at fault. There is too much overlapping of territory he stated and this works to the detriment of the dealer. He advocated considerably smaller territory and greater effort at intensified sales. Furthermore, he would not have territories divided by state or county lines but rather by the

topographical peculiarities of the dealer's field.

In the broad field of merchandising motor trucks, E. S. Foljambe dropped a bomb into the camps of the manufacturers by stating that they were not catering to the needs of the purchaser except in an extremely superficial manner. The great field for the commercial vehicle industry, he stated, is for small and medium sized vehicles. As an indication of the lack of attention to this great field he submitted that in the last year between from 60,000 to 80,000 Ford touring cars had been converted into commercial vehicles for the use of the small merchant.

As a further indication that the present tendency toward the construction of smaller, lighter vehicles is a logical one, he stated the somewhat astonishing fact that the average load carried by package delivery wagons is but 550 pounds. The genuine problem today he stated is to increase the ratio of pay to non-pay loads and one of the best methods of accomplishing this result is to use smaller vehicles, make more trips and carry more nearly the capacity rating.

#### Dealer Suffers from Price-Cutting

J. C. Millman, of the Stegeman Motor Truck Co., Milwaukee, Wis., in his paper entitled, "Reforms Needed in Merchandising Motor Trucks," stated that price-cutting by dealers was one of the greatest causes of lack of development in the motor truck industry. As an argument against the prevalent practice of offering discounts to users he submitted the unalterable fact that list prices are established by manufacturers after manufacturing costs have been compiled and that the figure put upon a truck is gauged by the maker to permit the dealer to realize a living profit. It obviously follows that where the list price is not adhered to the dealer suffers.

Price-cutting, he continued, is due to one of two causes; it results either from over-production, which is the fault of the manufacturer, or it is due to inefficient salesmanship, which is the fault of the dealer. The former can be overcome only by the maker, while the remedy for the latter lies in the hands of the dealer and can be applied by teaching his salesmen the principles of salesmanship which center about a knowledge of the goods he has to sell.

In the two papers which dealt with the relationship between the manufacturer and the dealer insofar as advertising is concerned, the keynote struck was that greater coöperation is necessary. R. P. Spencer, of the Denby Motor Truck Co., Detroit, Mich., suggested that the manufacturer has at his command the opportunity to obtain performance and cost data from his dealers which will enable him to suggest advertising which will be mutually advantageous. Although most truck advertising at present is prone to dwell upon the mechanical excellence of the vehicle, this is not altogether proper,

he stated, for the reason that the purchaser of a truck is more interested in dependability and economy of operation. Furthermore, he stated, no maker should attempt to lay down advertising rules for a dealer until he has made a thorough study of the conditions which obtain in that dealer's territory; in other words, an advertising campaign which will prove thoroughly satisfactory in Pittsburgh will probably fail dismally in Boston or New York.

The second paper on advertising, which was delivered by George A. Rees, of the Chicago Pneumatic Tool Co., also emphasized the necessity for close relationship between the dealer and the maker in the disposition of the advertising appropriation. The keystone of the plan put in force by Rees is what are called illustrated letters. These are four-page letters, the first of which, properly addressed, carries a direct message to the dealer. The remaining pages contain original illustrations and strong selling arguments. The feature aimed at in the letters is to have each of the illustrations of strong personal interest and in this way drive home the selling arguments.

That there is a broad field for the use of the motor truck on the farm was urged by Hugh McVey, of Successful Farming, who stated that if the increase in population continues at the present rate the word "starvation" would in 50 years be common on the street and in the daily papers. He explained his attitude and the expression by stating that at present an astonishing proportion of the grain yield of the United States is utilized to feed draft horses and that even now the problem of transporting foodstuffs from the farm to the market is becoming a serious one. The weakest link in the whole arrangement, he stated, is the transportation of foodstuff from the farm to the railroad station and it is here that the motor truck is destined to play an important part. The importance of the truck for this use, he continued, will depend largely upon the condition of the roads and for this reason urged that steps be taken all over the country to further the movement for an increase in good roads mileage.

#### Good Roads are Necessary

D. F. Poyer, of the D. F. Poyer Co., Menominee, Wis., also urged the necessity for the increasing use of the motor truck on the farm by pointing out the need for quick transportation of perishable foods from the farmer to the ultimate consumer. He, too, urged the need for more good roads as an economic feature for the better development of the motor truck industry.

In the discussion on these two papers it was brought out that contrary to the ordinary conception of the matter, the farmer as a rule takes good care of his motor equipment, and Poyer offered as his experience that farmers who own his trucks have been known to leave their other farm equipment, thresher, cultivator, etc., out in the fields in order that the motor truck

might be housed. The farmer, he states, in many cases, takes better care of his motor truck than does any other user for the reason that he has been educated to the necessity for caring for his horses.

That the driver of a motor truck plays an exceptionally important part in the performance of the vehicle and has a direct bearing upon its maintenance already is well established and in drawing attention to these two factors, H. S. Dunlavy, of the Federal Truck Co., Chicago, Ill., made a number of valuable suggestions. Briefly, Dunlavy would have every owner of a motor truck report the name of his drivers, that they may be listed. Against the name would be entered when engaged, when discharged, the reason for the discharge and other pertinent facts which would assist other owners who might contemplate the hiring of a particular driver. He suggests that both dealers and owners of trucks get together on some sort of a clearing house plan of the kind and offers that information of the kind would be of tremendous value in weeding out the inefficient drivers that are the bane of the motor truck industry because of their carelessness and ignorance.

#### Central Market Plan Impractical

The application of the idea contained in the Central Market Report for Used Cars, as conceived by H. M. Allison, of the Chicago Automobile Dealers' Association, is not possible, or rather is not wise at the present time, in the case of the motor truck industry, is the conclusion reached by Allison in a paper on this subject. Allison sets forth the following reasons why the idea cannot be made use of:

(1) Most trucks accepted in trade are unsaleable except as junk.

(2) A small proportion of the new truck business involves the handling of used trucks.

(3) To publish a market report on used trucks might create a false impression in the minds of dealers that used trucks are readily saleable.

(4) The different sizes, length of wheelbase, and styles of bodies would make it difficult to compile an intelligent report.

"If the evil of truck trading should become as burdensome to the truck industry as carriage trading has to the motor carriage industry, our association stands willing and ready, at that time, to publish such report on trucks," he concluded.

The topic of demonstrations and the necessity for them and for charging the purchaser for them was handled by J. C. Ayers, of the General Motors Truck Co., Detroit, Mich. Ayers holds that in the present condition of the motor truck industry demonstrations no longer are a genuine necessity but in the few remote cases where they cannot be escaped they should be charged for. In proof of this contention he offers that out of eighty-one demonstrations which were made, only one concern really purchased a truck of his company. Three others purchased trucks from other concerns.



On the other hand, when demonstrations were charged for, it was possible to turn no less than 87 per cent of them into sales. However, Ayers, points out, since Jan. 1, 1914, his company has made but three demonstrations of any sort. With regard to the charges which should be made for demonstrations, Ayers holds that these should cover the cost of the work and submitted the following table of charges which his company employs:

\$ 8.00 a day for a 1,500-pound truck.  
10.00 a day for a 1-ton truck.  
12.50 a day for a 2-ton truck.  
15.00 a day for a 3-ton truck.  
20.00 a day for a 5-ton truck.  
25.00 a day for special jobs such as dumping trucks.

These charges, Ayers states should not be credited to the purchaser, for they represent actual work performed and are for

goods actually transported for the purchaser.

Although the major part of the time of the delegates was taken up by more or less prosaic business subjects, the social side of the program was by no means neglected. On Wednesday evening the Detroit committee tendered the delegates a Dutch luncheon and cabaret show in the banquet hall of the Cadillac. On Thursday evening there was a theater party at the Temple theater, also under the auspices of the Detroit committee, and on Friday evening there was held the banquet. Among the more prominent speakers were Captain Carden, of the United States army; James Schermerhorn, Walter Wardrop and John Lee Mahin.

## Hess-Bright Mfg. Co. Wins Patent Suit

### Important Decision in Ball Bearing Case

PHILADELPHIA, Pa., Oct. 10—The Philadelphia circuit court of appeals has handed down a decision in favor of the Hess-Bright Mfg. Co., in its suit against the J. S. Bretz Co., of New York, practically based on that feature of the Conrad patents Nos. 822, 823 and 838,303, covering the continuous and uninterrupted race type of construction in ball bearings.

The suit was brought last year by the Hess-Bright Mfg. Co., of Philadelphia, and the Deutsche Waffen und Munitions Fabriken of Germany against Hedwig Fichtel and Ernst Sachs of Germany, doing business as Fichtel & Sachs, and their exclusive American representative, the J. S. Bretz Co. of New York.

The complaint was infringement of the Conrad patents mentioned by F. & S. bearings manufactured and sold by the defendants. Judge McPherson in the United States district court of Philadelphia handed down the decision in favor of the J. S. Bretz Co. last December, and shortly afterward the Hess-Bright interests appealed the case to the circuit court of appeals, which has just decided in their favor.

The case was argued before Circuit Judges Buffington and Hunt and District Judge Witmer. In the decision Judge Buffington brought out the following points:

It will be noted that Conrad's patent is for finished ball bearings adapted for use and not for the method of assembling. Thus in his patent he says: "I do not claim in the present application to describe method of assembling the parts of my improved ball bearing, this method being claimed in a divisional application filed May 18, 1906." And, as showing that his patent was for a finished ball bearing, adapted for use, he says: "The principal advantage of the new bearing lies in the continuity of the size of the groove, which insures the regular running of the balls, and consequently great durability of the bearing."

The practical ball bearing art as practiced prior to Conrad's patent was well described by Judge Holland in 177 Fed. Rep. 144 in these words: "Many patents have been issued for ball bearing devices, which have not been entirely satisfactory for the reason that the tracks or ways were interrupted and the ball consequently could not travel freely therein. It was old to have inner and outer rings with opposing grooves, but the sides of these grooves were interrupted in one way or another to per-

mit the introduction of the balls. In some cases, filling openings were provided and in some instances these were filled up or plugged after the balls had been introduced in order to prevent the escape, but these prior devices were defective in that the raceways would crumble or wear at the interrupted parts of the raceway, and then the injured balls would cause undue wear to the remaining portions of the raceway, and thus the bearing suffered a rapid depreciation, and often entire failure in a comparatively short time, and where the filling openings were plugged to prevent the escape of the balls the plugs could not be given precisely the same temper as the rings forming the remaining portion of the raceway, and unequal wear would ensue which resulted in injury to the balls and raceway, and an undue shortening of the life of the bearings. These bearings could safely be subjected only to light loads, and were entirely unsatisfactory and not fitted for use in heavily-built, rapidly-moving vehicles."

Conrad simply brought into the art a metallically unbroken groove pathway for the balls. This pathway he kept unbroken by introducing the balls by eccentric displacement of the rings; the retention of the balls and the concentricity of the rings he effected by ball spreaders. Conrad's novelty and contribution to the art consisted in disclosing the actual use of a continuous or unbroken groove as a pathway for a ball bearing.

The specification as originally made together with all the claims were not satisfactory to the office—a fact possibly due to the non-familiarity of the foreign applicants with American patent requirements—and in the subsequent proceedings each and every one of the original claims were rejected. The entire original specification was then withdrawn and another substituted. These facts are all important for the contention of the defendant in effect is, that the claims granted should be given the effect the claims originally made would have had. That the device itself for which Conrad received his final claims was the same one for which he sought his original claims there is no question. But while Conrad had in view the broad, general character of the ball bearing he there disclosed and illustrated, we think his specifications as originally drawn did not specifically and with exactness define wherein the precise inventive feature of his device lay nor did he properly confine his claims to such inventive feature.

As we have seen, the gist of the ball bearing disclosed by Conrad was the unbroken, continuous, unrecressed and integral grooved pathway. When, however, he came to make all three of his original claims they were each and all not for such grooves, but for rings "unrecressed and unbroken." While, of course, such an "unrecressed and unbroken" ring undoubtedly physically had on its face Conrad's "unrecressed and unbroken" groove, yet the unbroken face of the ring was a mere mechanical strengthening incident for no matter how much the ring face, as a face unbroken and unrecressed, the invention did not lie in the integrity of the ring face but in the continuity of the sides of the groove.

Such being the case, it is clear that the claim originally made for rings "unrecressed and unbroken" needlessly embodied in the claim the narrowing limitation of necessitating the ring surface to be unbroken when the real invention lay in requiring the groove side to be unbroken and unrecressed. And anticipating what will later be apparent we may here say that if

Conrad's claim had thus remained for "unrecressed and unbroken" rings the defendant would have avoided infringement of this narrow claim by merely slotting its rings though in doing so it had cut into and broken the continuity of the sides of the groove.

Presumably attention must have been called to this fact by the office, since in the new specification and the claims which met the office's approval, this oversight was remedied and in the new specifications it was shown that "the principal advantage of the new bearing lies in the continuity of the side of the groove" and new claims were made, not for rings "unbroken and unrecressed" as before, but for "opposing grooves on their adjacent faces, the sides of said grooves being uninterrupted throughout their circumference"; "each ring having a groove both sides of which overhang said balls and are continuous and practically integral throughout their circumference."

We find nothing in the way of prior patenting, or use that suffices to shear Conrad's device of patentable novelty, for without entering into a discussion of the prior art, we may say that while ball bearings were known and used, there was prior to Conrad no use of ball bearings in the high speeds and heavy loads which his device has made possible. \* \* \* We therefore hold the claims of his patent here involved are valid. The question of infringement practically and mechanically turns on the effect and sufficiency as a ball confiner of a steel dam or barrier so slight in height that its gradual rise from the central line of the balls' grooved pathway ceases when 44/10,000 of an inch is reached. The court below said: "How such a minute fraction as 44/10,000 of an inch would 'overhang' is not perceptible." At bar, counsel for complainant stated, that if this defendant cut his channel entrance deeper by 44/10,000 of an inch all question of infringement would be abandoned. That the curve does "overhang" the ball is, we think, self-evident.

The methods of introducing the balls are practically the same in the case of both complainant and defendant, the slot-inserted additional balls of the defendants' device being the mechanical equivalent of Conrad's spreaders.

The decree dismissing the bill must therefore be reversed and the case remanded with directions to the court below to enter a decree holding the claims in issue valid and infringed and directing an accounting.

### WILLARD BUILDING NEW PLANT

Cleveland, O., Oct. 12—The Willard Storage Battery Co., maker of the LBA battery, having broken ground on September 24 for its new plant, is pushing the work rapidly and the plant, when completed, will contain 6 acres of floor space, leaving ample room for further expansion. Ten buildings will comprise the plant under existing conditions and 10 acres of land are used for the layout. All the buildings will be of brick.

It is the intention of the company to have the administration and several other buildings under roof before snow flies, so that they may be ready for occupancy as soon as practical in the early spring. Both factories, the old one at present occupied, and portions of the new plant as fast as completed, will be operated in conjunction, to afford ample production facilities for the business of the early months of 1915. The construction of all buildings will progress as rapidly as possible and in such manner as not to interfere in any degree with the regular routine or to cause the slightest cessation in process of manufacture.

### MODEL J. SPARTON \$9.50

The Sparks-Withington Co., of Jackson, Mich., manufacturer of the Sparton warning signal, calls attention to the fact that in some of its recent advertising there was a misstatement on price. There are several models of Sparton signals ranging from \$15 to \$5. Through a typographical error model J Sparton was quoted at \$9. The price should have been \$9.50.

# The Cactus Derby, the Coast's Classic

by AL G. WADDELL.



**L**OS ANGELES, Cal., Oct. 8—The Cactus Derby—that is what they call the great desert motor classic, the annual Los Angeles-Phoenix road race. Never has a more severe test for car and driver been devised than the long grind over the desert roads of California and Arizona, entered each year by the premier racing drivers of the far west. Every road condition known to the motorist is encountered on the difficult course of this, the most unique contest of the motor age.

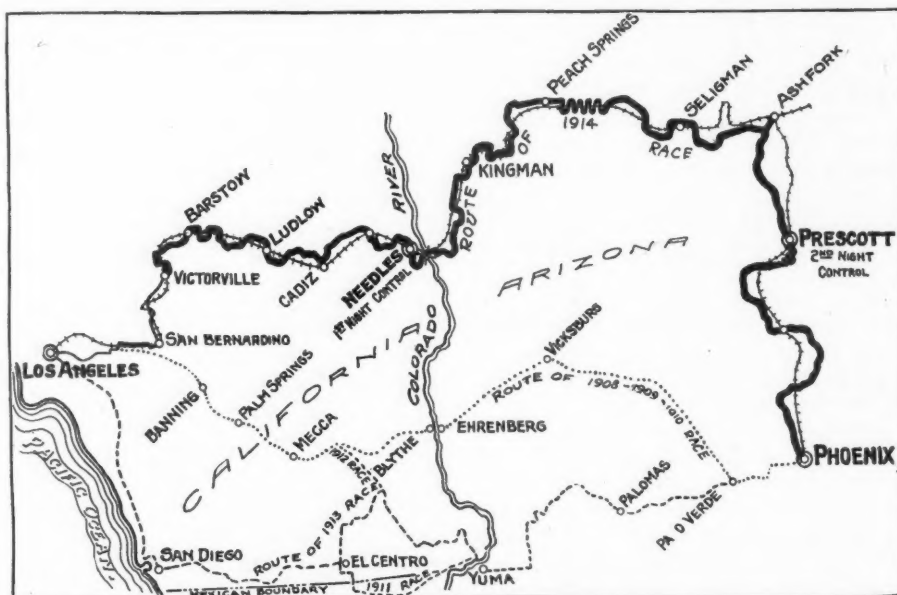
## From Macadam to Sand

From Los Angeles, the race is out over the famous Southern California boulevards, through the orange groves and suburban cities, to the hard dirt roads of San Bernardino county and then on to the edge of the desert, where the sand battle begins which lasts until the city of Phoenix, Arizona, is reached, hundreds of miles away. The first few miles of the course are as fast as the famous Santa Monica race trail. There are stretches even on the desert where speedway time may be made, but for hundreds of miles deep sand and sharp rocks hold the drivers down to a few miles an hour.

At daybreak November 9 the seventh annual Cactus Derby is to start from the city limits of Los Angeles. Traditions have been ignored this season and an entirely new course has been selected for the Los Angeles-Phoenix dash. The southern route, followed for the past 6 years by the desert racers, has been abandoned. The 1914 Cactus Derby is to be run over the Santa Fe-Grand Canyon-Needles National highway from Los Angeles to Ash Fork, Arizona, and from there the course is to the south through the mile-high city of Prescott to the finish at Phoenix. The first night's control is at Needles, 303.5 miles; the second night at Prescott, 254 miles further, while the finish is another 134 miles. The total distance is 691.5 miles.

The new elements which enter into the contest this year give it the coloring of the greatest of all revivals of the desert classic. The race is to cover 3 days. There are to be two night controls and the course is longer by 200 miles than any covered in the past by the Phoenix road racers.

Spartan courage is needed by the man who drive in the Cactus Derby. More than 500 of the 691.5 miles of this difficult route are over the desert sands, where all nature seems to fling a challenge at humanity and where only daring and skill



MAP SHOWING 1914 CACTUS DERBY COURSE; ALSO THOSE USED IN PRECEDING YEARS

will overcome the obstacles she has raised. The flight across the desert is a supreme test for the strength of man and the stamina of mechanism.

For the first time in the history of the extraordinary race, the drivers will have a suitable reward to strive for. The first few desert races carried no cash at all and the purse never has been more than expense money. The western drivers have entered the contest year after year and battled across the desert more for sport than anything else, but the 1914 Cactus Derby is to carry the title of the "Master Driver of the World."

## Gold Helmet to Victor

The race management has raised a sum of money which is to be used for the purchase of a racing helmet, decorated with a crown of gold. This trophy is to go to the winner and, as a perpetual challenge decoration, should in time become one of the most famous motor racing prizes in the world.

While the purse offered by the Phoenix road race management is \$5,000, it is a paltry sum. The race costs each entrant almost that amount and the great contest should carry a purse of at least \$25,000. Phoenix annually contributes \$2,000 to the purse. The towns along the route raise the rest of the prize money, with the exception of the entry fees, which also are added to the prize money total.

The Phoenix road race trophy, a small silver cup, goes to the winner of each an-

nual desert classic, in addition to the prize money. When the race first was conceived, in the fall of 1908, the small silver cup was the only prize offered. The entrants framed some side bets among themselves, however, but the official prize was but the small loving cup.

## Winners of Past Races

In the past this has been won as follows: 1908, Captain Harmon D. Ryus and Colonel F. C. Fenner, White steamer; 1909, Louis Nikrent, Buick; 1910, Harvey Herrick, Kisselkar; 1911, Harvey Herrick, National; 1912, Ralph Hamlin, Franklin; 1913, Olin Davis, Locomobile.

The change in the course this year was brought about by two conditions. The supervisors of Orange county were afraid that the highway construction work now going on in that county in preparation for the exposition motor travel would interfere with the race and suggested that the inland route to San Diego be adopted for 1914. San Diego then suggested that the start be made from that city and offered to contribute \$2,000 to the purse if it was made a San Diego-Phoenix race. The Los Angeles motorists and race enthusiasts objected to this plan and it was decided to make it a Los Angeles-Phoenix-San Diego exposition race, the same as the year before.

After the entry blanks were out and the date of the race had been announced, complications arose. San Diego and the race officials at Phoenix could not get together



on the matter of the purse and as a great surprise, came the announcement that a new course was to be selected.

While the race is promoted each year by the Maricopa Automobile Club of Phoenix, Arizona, the management rests with the Western Automobile Association and Leon T. Shettler, chairman of the racing committee of that organization, with headquarters at Los Angeles, virtually manages the great race. When word was sent out from Phoenix calling for a new course, Chairman Shettler arranged for a pathfinding tour and started out on the northern course, never before considered for the Phoenix road race.

The Santa Fe-Grand Canyon-Needles National highway, over which the desert classic is to be run this year as far as Ash Fork, was conceived in the late months of 1913, and January 1, 1914, was a reality. The route is now being signposted by the Automobile Club of Southern California from Los Angeles to Kansas City and the signs already have been erected beyond the town of Ash Fork, where the desert racers leave the transcontinental highway.

From Ash Fork to Phoenix there are practically no road signs at present. The racing men will have to depend on their own knowledge of the course except where county officials of Arizona have erected temporary signs for the racers' benefit.

While the Old Trails route is signposted and is by far the best transcontinental trail across the California and Arizona deserts, it is not a boulevard by any means. It is figured by veteran desert racers who have been over the course that an average of 35 miles an hour will win the race this year. Davis in the winning Locomobile averaged 31 miles an hour last year, but that time should be bettered with the two night controls and the improved road conditions, such as they are.

#### Race to Encourage Road Work

Every town along the route responded liberally with contributions to the purse and there never was such enthusiasm displayed in advance of a Phoenix race as that which greeted the members of the route-blazing crew on their run across the desert. The race will encourage the building of good roads through the country visited by the racing cars and the element of sport which enters into the great motor race is appreciated all along the course.

After the Santa Fe-Grand Canyon-Needles route had been inspected, the course was not officially adopted until conferences had taken place between Maricopa Automobile Club officials and the Western Automobile Association management in Los Angeles. There were many details to be worked over before the route could be selected for the great run next month. The length of the course was the most difficult problem to be solved, but the addition of a second night control settled the matter.

It was proposed to run the race from Los

Angeles through the San Fernando valley and over to Victorville through the mountains to the north of Los Angeles which fringe the Mojave desert. The leg of the course was inspected and mapped, but the motoring public of San Bernardino objected and bolstered up their protests with several hundred dollars for the purse and the result was the official announcement of the 691.5-mile course and the 3 days of racing.

From Los Angeles to San Bernardino, a distance of 59 miles, the roads are perfect. There is one long stretch of new state highway which will stand all the speed the cars have. From the first checking station at San Bernardino, the course turns to the north and winds up through the famous Cajon pass. Through the pass the drivers will not be able to use speed to advantage. There are many dangerous curves, deep washes and steep climbs. For miles, the road is so narrow that the cars can not pass.

#### Where the Roads End

At the summit of the Cajon, the desert road to Victorville begins. This road is a hard decomposed granite road, good for all the speed in the cars. Beyond Victorville, the road continues across the desert to Barstow with few turns and in excellent condition. Barstow is 147 miles out of Los Angeles and with the excellent roads, the drivers should be through the desert town before the sun begins to beat down on the sands.

Daggett is but 9 miles east of Barstow and at this point the roads end. With an occasional mile or so of fast highway, the course stretches across the desert and up through the mountains toward the finish with no letup to the hard pounding and rough going. Through Newberry Springs, Ludlow, Bagdad and Cadiz to Goff's Station, a distance of 129 miles, there is nothing but desert. The road is cut deep with ruts and the heavy sand blows from the front wheels into the driver's faces. Where there is not the deep sand, there are rocks and deep chuck holes, and all the time the car is climbing up a steep grade.

From Goff's into Needles, the first night

control, a distance of 31 miles, the road is somewhat better. The course drops about 2,000 feet in the 31 miles and after a siege of deep washes and high banks, which give the drivers the sensation of riding on a giant roller-coaster, the road makes two sharp and dangerous turns and enters the little city of Needles, on the bank of the muddy Colorado.

#### Scenic Drive from Needles

Seventeen miles above Needles, the Santa Fe bridge has been planked and the racers will cross the river at that point, checking out between trains. The run up the river from Needles to the bridge is one of the most scenic on the entire course. The road climbs out over rugged hills and through deep canyons, back to the river bank in the shadow the towering cliffs which give Needles its name.

On the Arizona side of the Colorado, the rough going really commences. From Topock to Yucca, there is the deepest sand on the entire run, with the possible exception of the silt road beyond Peach Springs. The drivers will be fresh on this part of the run however and the going will not be at its worst. From Yucca into Kingman, 24 miles, the road is fast again and out of Kingman to Hackberry, 30 miles, the desert road is like a speedway, especially after a rain, such as are common in northern Arizona in the fall. On this piece of the course the route is through the famous grazing country where the range cattle still run wild. The highway is flanked with the bones of cattle and all along the course bunches of steers worry the driver of a motor car by jumping out on the road.

Out of Hackberry, the town which blooms with the sheep-shearing seasons, the road is in fair shape for a few miles, but soon drops into ruts and hollows.

At Peach Springs the silt road bed is picked up and for 6 miles there is little chance of a driver's making better than 10 miles an hour. With high centers and the fine dust choking every breath, the 6 miles seem to be half the distance to Phoenix. From Nelson to Yampi, 9 miles away, the road continues rough and dan-



LEON T. SHETTLER BLAZING CACTUS DERBY TRAIL IN PAIGE-DETROIT

gerous, but there is not that silt to be encountered. Up through Nelson's canyon, the road warps back and forth across the railroad tracks nine times, each time passing through a narrow cut in the road-bed bank, beneath the tracks.

Fifty-six miles east of Yampi is Seligman. This stretch is a wild drive through the open country of famous sheep and cattle ranches of northern Arizona. The course continues on east from Seligman to Ash Fork, a distance of 28 miles, then turns abruptly to the south. Prescott, the second night control station, is 63 miles below Ash Fork, 5,347 feet high in the pine-studded mountains of the rich mining, cattle-raising and farming country of Arizona.

Out of Prescott, on the morning of the third day, the racers will climb to an elevation of 7,000 feet then drop 3,000 feet to Skull valley, within 10 miles, on the final dash into Phoenix, 134 miles from Prescott. The run down the mountain is both

dangerous and difficult. There is a dozen places where a slip of a brake will send car and driver over into a canyon, hundreds of feet below. Through Kirkland, Stanton, Congress Junction and Wickenburg the course winds over rugged hills, under overhanging cliffs, and through cactus beds to the Maricopa county line, and to the finish.

The first 71 miles are not bad, although there are many dangerous turns and railroad crossings, and from the Prescott to the Maricopa county line, the roads are generally hard and in fair condition. Between Wickenburg and Phoenix the road is most difficult. There are heavy grades, deeps and washes, sharp rocks and ruts. At this stage in the race the machines will be well battered up and the last few miles will spell agony for the drivers.

Only one who has covered the course in a racing car can realize what a driver and his mechanic suffer in the Phoenix race.

Cars start out in perfect condition and finish with bearings loosened, motor shaky, axles bent, truss rods broken, transmission shaken out, tires eaten up, brakes worn out, steering knuckles bent and barely holding up under the strain. Cars which start out with a speed of 80 or 90 miles an hour reach Phoenix with but 40 or 50 miles on tap. But the driver and his mechanic suffer, too.

At the finish of the Cactus Derby the men who have crossed the desert in the racing cars are bruised about the back and limbs sometimes for days. Their hands are swollen, their lips are chapped and bleeding, their eyes are full of sand which seeps behind the goggles and their feet are swollen. The factory officials do not know what their cars go through in that great race on the desert trail and the public does not realize what the driver will have to stand up under to win the seventh annual Cactus Derby.

## Route Information for Motor Age Readers Who Tour

### Denver, Colo.-Louisville, Ky.

DENVER, COLO.—Editor Motor Age—Kindly give a route to Louisville, Ky.—H. B. Mahon.

All told the best road will probably be found by first routing 144 miles to Sterling through Watkins, Bennett, Fort Morgan, and Merina; to Julesburg, 64 miles through Powell, Dorsey, Sedgwick; to North Platte, Neb., 85 miles through Big Springs, Ogallala, Paxton, Sutherland; to Grand Island, 164 miles through Gothenburg, Lexington, Elm Creek, Kearney, Shelton; to Omaha, 147 miles through Chapman, Central City, Duncan, Columbus, Schuyler, Fremont, Waterloo, Elkhorn.

Across Iowa the Blue Grass trail extends through Council Bluffs, Glenwood, Hastings, Red Oak, Nodaway, Corning, Creston, Afton, Osceola, Chariton, Melrose, Albia, Ottumwa, Batavia, Fairfield, Mt. Pleasant, to Burlington.

Across Illinois to Indianapolis the towns are Monmouth, Galesburg, Knoxville, Maquon, Farmington, Hanna, Peoria, Mackinaw, Danvers, Bloomington, LeRoy, Farmers City, Mahomet, Champalgn, Urbana, Danyille, Covington, Veederburg, Hillsboro, Crawfordsville, and Jamestown.

The Indianapolis-Louisville stretch follows through Franklin, Edinburg, Columbus, Waynesville, Seymour, Uniontown, Scottsburg, Memphis, and Sellersburg.

### Prescott, Ariz.-Green River, Utah

Jerome, Ariz.—Editor Motor Age—Kindly give the routing and mileage with other necessary data from Prescott to Green River, Utah. How about weather conditions late in fall?—A. West.

You will be able to make this trip without any difficulty as late as the first of the year. To reach Springerville, you can choose between going through Askfork to Flagstaff, Winslow, Holbrook and Concho or through Kirkland, Wickenburg, Beardsley, Phoenix, Mesa, Roosevelt, Livingston, Globe, and White River with preference for the latter.

To Magdalena, N. M., it is 131 miles via Quemado, Continental Divide, Datil; to Santa Fe it is 164 miles via Socorro, taking provisions and supplies to suffice as far as Albuquerque 76 miles, Escondida, Becker, Albuquerque, Domingo, and La Bajada. Reach Las Vegas through Glorieta, Pajarita and Bernal being 75 miles and Trinidad through Wagon Mound, Springer, Maxwell, Raton, and Starkville being 139 miles.

To Pueblo run 91 miles through Aguilar, Rouse, Lester, Walsenburg, and Abbey and then

over a fine convict road via Bragdon, Fountain, Colorado Springs, Breed, Monument, Palmer Lake, Littleton. Denver to Laramie, Wyo., is 130 miles first over good gravel to Lafayette, Longmont, Berthoud and Loveland then prairie road to Ft. Collins, La Porte, Owl Canyon and Red Buttes.

Following the Lincoln highway the balance of the way the routing is 126 miles to Rawlins, via Wyoming, Lookout, Pine Ridge, Medicine Bow, Hanna, Coyote Springs; to Rock Springs, 114 miles via Wamsutter, Tipton, Point of Rocks; and to Green River, 15 miles via Blairtown.

### Paris, Ill.-Albany, Ore.

Paris, Ill.—Editor Motor Age—I am contemplating a trip to Albany, Ore., located some 80 miles south of Portland. What is the best and shortest route, road conditions and best time of the year to make the trip? How about the Borderland trail, and what is the nearest point where I could reach this route?—A. N. Wieder.

The shortest and best road is the Lincoln highway to Sacramento, Cal., with a few deviations for better roads then the Pacific highway through Red Bluff, and Redding, Cal., and Medford, Roseburg, and Eugene, Ore. The summer months are the best time of the year for the trip.

The Borderland trail is used for travel to the coast in late fall and winter. You would connect with this road at Dodge City, Kan., which is also on the Santa Fe trail and can be followed from Kansas City to the intersection. This Borderland trail runs through a corner of Texas, southern New Mexico, Arizona to San Diego, Cal., and would mean that you follow the Pacific coast from that city north through Los Angeles, Santa Barbara, Paso Robles, Salinas, San Francisco, and Stockton.

To reach Kansas City you should head for Springfield, Ill., taking the Alton Way to St. Louis and the Santa Fe across Missouri to Kansas City.

### Lee, Ill.-Deming, N. M.

Lee, Ill.—Editor Motor Age—I would like to know a good route to Deming, N. M. I want to make the trip this month. What would be the mileage?—R. G. Nowe.

Route to West Brooklyn, Mendota, Princeton, Sheffield, Anawan, Atkinson, and Moline, to Davenport, Ia. The Great White Way can then be traversed through Blue Grass, Pleasant Prairie, Muscatine, Fredonia, Columbus City, Washington, Harper, Springfield, Oskaloosa, Pella, Monroe, and Prairie City to Des Moines. To

Davenport it is 140 miles and to Des Moines is 194 miles.

The Interstate trail is the next road to be traversed and this as far as Kansas City. Des Moines to St. Joseph is 196 miles, a run through Somerset, Indianola, Medora, Liberty, Osceola, Davis City, Lamoni, Eagleville, Bethany, Albany, Ford City, King City, Union City and Rochester. On to Kansas City pass through Halleck, Dearborn, Edgerton, Smithville, Nashua, and Gashland, 63 miles.

Over the Santa Fe trail to Dodge City, which also marks the beginning of the Borderland trail, the run is 97 miles to Osage City via Shawnee, Pleasant View, Olathe, Newton, Baldwin, Overbrook, Scranton, Burlingame; 127 miles to McPherson via Admire, Allen, Council Grove, Herington, Lincolnville, Marion, Hillsboro; 148 miles to Dodge City via Windom, Mitchell, Lyons, Great Bend, Pawnee Rock, Larned, Offerle, Spearville, and Wright.

The Borderland trail is your road the balance of the journey and the itinerary lies through Fowler, Meade, Plains, Liberal, Goodwell, Texhoma to Stratford, 198 miles; 90 miles to Amarillo through Dumas and Goodnight ranch; 178 miles over medium roads through Canyon, Happy, Tulla, Plainview, Hale Center, Abernathy, Lubbock; to Roswell, N. M., 146 miles via Gomez, Tokio, Plains, Bronco; to Alamogordo 126 miles through Hondo, Ruidoso, Mesquero; and 195 miles to Deming via El Paso, Canutillo, Lanark, Afton, Cambray, and Carne.

### Winslow, Ind.-Jacksonville, Fla.

Winslow, Ind.—Editor Motor Age—We are contemplating a trip south to Jacksonville and Daytona, Fla., and want to know something about a guide as we do not know anything about the roads.—T. C. Nelson.

Best road conditions, accommodations, etc., will be found by routing through Vincennes and Sullivan to Terre Haute on the National highway, and following it through to Hagerstown, via Indianapolis, Richmond, Springfield, Columbus, Zanesville, Wheeling, Uniontown, and Cumberland.

South from Hagerstown follow the New York-Atlantic highway to Roanoke, Va., Winston-Salem, Charlotte, Greenville, to Atlanta, Ga., then take the inside route through Macon, Tifton, Valdosta, Live Oak, and Baldwin to Jacksonville and the coast road through St. Augustine to Ormond and Daytona.

The volume 4 will take you to Wheeling and the volume 3 to Daytona or any other southern city. Each book is \$2.50 and can be procured



from the Automobile Blue Book Publishing Co., Chicago.

A great deal of improvement has been going on in the south since last season and consequently roads will be found considerably better.

Tipton, Ia.—Editor Motor Age—Please give the best route to Jefferson, Ia.—J. Reader.

Go north to Stanwood on the Lincoln highway and follow it all the way to Jefferson. It routes through Mechanicsville, Mt. Vernon, Marion, Cedar Rapids, Belle Plaine, Chelsea, Gladstone, Montour, Le Grand, Marshalltown, State Center, Nevada, Ames, Boone, Ogden, Beaver, and Grand Junction.

#### Bloomington, Ill.—Monmouth, Kan.

Delavan, Ill.—Editor Motor Age—What is the route from Bloomington to Monmouth, Kan., which is 16 miles west of Pittsburg, then to Maxwell, Ia.?—A Reader.

Go to Burlington, Ia., via Danvers, Mackinaw, Peoria, Hanna, Farmington, Maquon, Knoxville, Galesburg, Monmouth, and Okmawka then across Iowa on the Blue Grass trail through Middletown, New London, Mt. Pleasant, Glendale, Fairfield, Batavia, Ottumwa, Blakesburg, Albia, Melrose, Russell, Chariton, Woodburn to Osceola thence to Kansas City over the Inter-State trail, which extends through Leon, Davis City, Decatur City, New Hampton, Albany, Ford City, King City, Rochester, St. Joseph, Halleck, Dearborn, Edgerton, Smithville and Nashua.

A better road to Monmouth will be found by running through Kansas via Martin City, Olathe, Edgerton, Ottawa, Garnett, Humboldt, Chanute, then to Parsons and your destination.

For the run to Maxwell, Ia., retrace your routing to Osceola, Ia., and continue to Des Moines 50 miles through Liberty, Medora, Indianola, and Somerset, then north through Ankeny and west to Maxwell.

#### Remington, Ind.—Ashville, N. Y.

Remington, Ind.—Editor Motor Age—I want to tour to Ashville, N. Y. Kindly also give me the mileage.—W. M. Broadie.

Head for Lima, O., reaching it through Wolcott, Reynolds, Monticello, Delphi, Flora, Kokomo, Sycamore, Marion, Montpelier, Petroleum, and Mercer. Lima to Cleveland runs through Beaver Dam, Bluffton, Findlay, Fostoria, Tiffin, Clyde, Bellevue, Norwalk, Townsend, Oberlin, Elyria, and Dover. It is 198 miles to Lima and 161 to Cleveland.

Go east to Westfield, N. Y., a run of 132 miles through Euclid, Willoughby, Painesville, Madison, Unionville, Ashtabula, Conneaut, Girard, Erie, Wesleyville, North East, and Ripley, then south to Ashville, which is 21 miles through Mayville and Stow.

#### Hydro, Okla.—Arcadia, Fla.

Hydro, Okla.—Editor Motor Age—I am contemplating a trip to Arcadia, Fla., and want to go through Vicksburg, Miss. What is the best route with general condition of roads? What volume of Blue Book will I need and what will it cost?—E. P. Smith.

Go to El Reno and Oklahoma City, then north over the road outlined for the Hoyt, Tex., inquiry and follow it as far as Nashville, Tenn.

Between Nashville and Atlanta the run is via Murfreesboro, Manchester, Hillsboro, Pelham, Tracy City, Jasper, Chattanooga, Rock Spring, Lafayette, Rome, Cartersville, and Marietta. An inside route to Arcadia follows through Jonesboro, Griffin, Forsyth, Bolingbroke, Macon, Vienna, Sibley, Ashburn, Sycamore, Tifton, Eldorado, Adel, Mineola, Valdosta, Madison, Fla., Falmouth, Live Oak, O'Brien, Branford, High Springs, Gainesville, Ocala, Holden, Inverness, Brooksville, Dade City, Plant City, Bartow, Homeland, Fort Meade, Bowling Green, and Wauchula.

Blue Books 5, 4 and 3 will be needed for entire directions on this route, and each volume is \$2.50.

You would not succeed in reaching your destination were you to follow a road which would

take you through Vicksburg. The roads are very poor.

#### Dallas, Tex.—Birmingham, Ala.

Hoyt, Tex.—Editor Motor Age—I would like a route from Dallas to Birmingham, Ala.—R. E. Wright.

The best road takes you north through Oklahoma traversing through McKinney, Anna, Howe, Sherman, Denison, Durant, Milburn, Sulphur, Wynnewood, Lexington, Oklahoma City, Guthrie, Mulhall, Orlando, Perry, Ponca, Newkirk, Arkansas City, Winfield, and Eldorado to Florence on the Santa Fe trail, which is followed east to St. Louis, first to Kansas City through Clements, Elmdale, Cottonwood Falls, Saffordville, Emporia, Waverly, Williamsburg, Ottawa, Edgerton, Olathe, and Martin City.

Across Missouri the routing is Independence, Levasy, Wellington, Lexington, Marshall, Slater, Glasgow, Armstrong, Yates, Higbee, Renick, Clarke, Mexico, Martinsburg, Wellsville, Montgomery, New Florence, High Hill, Jonesburg,

Warrenton, Wright City, Wentzville, Colterville, St. Charles.

A better road will be found by coming north to Springfield over the Alton Way, which is by way of Granite City, Alton, Brighton, Medora, Carlinville, Girard, Virden, Thayer, Chatham, and Springfield. To Indianapolis the towns are New Buffalo, Decatur, Tuscola, Newmar, Chrisman, Rockville, Bainbridge, Danville. To Louisville run through Franklin, Edinburg, Taylorville, Columbus, Waynesville, Jonesboro, Seymour, Uniontown, Crothersville, Scottsburg, Memphis, and New Albany.

Directly south to Birmingham is a run through Brentwood, Columbia, Pulaski, Elkmont, Decatur, Hartsells, Cullman, Hanceville, Morris and Birmingham. The run to Montgomery is via Pelham, Montevallo, Thorsby, Clanton, Marbury, and Wetumpka, and on to Mobile routes via Selma, Pine Hill, Thomasville, Grove Hill, Jackson, McIntosh, Malcolm, Mt. Vernon, Axis, and Saraland. The total distance from Dallas to Birmingham is 1,830 miles.

## Export Expert Talks on South America

### P. S. Steenstrup Says Motor Business Has Been Overdone

DETROIT, Mich., Oct. 10—"In all the countries south of the United States, that is, Mexico, Central and South America, there are not over 27,000 motor cars, according to statistics which I have secured, and of that number, about 15,000 are in Brazil and Argentina," said Peter Severin Steenstrup, export representative of the Hupp Motor Car Co., in South America, who now is visiting in Detroit.

"The motor car business in South America really has been overdone, and this is especially true concerning high-priced cars. The business is done mostly on a consignment basis with most of the European manufacturers. Through their banks in the different South American countries they are able to investigate very quickly the financial standing of their agents or of the importers handling motor cars, and sometimes they grant more than 90 days for the settlement of their accounts. However, in many cities the customs are now crowded with high-priced cars, which have not been taken out by the consignees. As the storage charges amount to 1 per cent of the invoice for the first month, 2 per cent the second month, 4 per cent the third month, and thus keep on an ascending scale, the price to be paid for the cars when the consignee finally is in a position to take them out is generally so high that the cars are left with the customs and thus annually a large number of high-priced cars have to be sold by the government or rather by the customs. Generally the prices obtained are not higher than what a medium-priced new car costs.

"Last May there were 300 such imported cars in the customs house at Buenos Ayres, Argentine, and I know of two instances where \$5,000 cars were offered for \$2,000, and it was not at all an easy matter to find purchasers, notwithstanding their real value.

"The majority of cars owned in South America are bought by the wealthy city

people who are able to afford a chauffeur. The number of owner-drivers is very small, but with the advent of the moderate priced American cars it is very likely that the number will be increasing more rapidly.

"The number of farmers owning cars is still relatively small, but during the last 18 months the number has increased and is certain to go on increasing, as the dealers are directing their efforts much more than heretofore to the agricultural sections of the country, such as the provinces in Brazil where coffee is grown.

"The greatest drawback for the more rapid progress of the motor car business in most all of the South American countries is the entire lack of good roads, for outside of the highways and roads near the big cities, there are hardly any roadways at all. Even in Africa one will find better highways than in South American countries. As an example of this, I will cite the case of a party of motorists which made a trip from Rio de Janeiro to Sao Paulo, a distance of about 400 miles—about as far as from New York to Buffalo—and it required 13 days to make the trip.

"In Argentina there is now a big movement afoot for having good roads built, as the recent extraordinary season of rain—it rained practically continually during the months of March, April and May—made the highways and roads absolutely impassable. As a consequence 30 per cent of the corn crop was absolutely lost, as it was impossible to haul it to the railroads. This would not have happened if stone or macadam roads had existed.

"Under ordinary weather conditions it requires about 10 hours to drive from Valparaiso to Santiago, in Chili, the distance being some 100 miles, but part of the year, during the rainy season, the roads are impassable and motor car traffic impossible.

"The establishment of American banks will boost car sales."

# The Readers' Clearing House

## REMOVING CARBON WITH OXYGEN How the Work is Done—Insert Dummy Spark Plugs

**HUMBOLDT, Kan.**—Editor Motor Age—Kindly explain how oxygen is used to remove carbon from cylinders. I have an oxy-acetylene welding outfit but cannot understand what method is used to start combustion between the carbon and oxygen, as the carbon must be at a very high heat before combustion will commence.—B. H. Boss.

It is suggested that the day before operations are to begin the engine be given the conventional kerosene treatment. A half-tumblerful of kerosene is poured into each cylinder and permitted to remain there over night.

As a precaution against fire the gasoline is shut off from the carbureter and the motor started so that the fuel in the line will be consumed. Work is done on one cylinder at a time. Taking the first cylinder, a cylinder plug is removed. The motor is then turned over until the piston of that cylinder is on top dead center. If the spark plugs are not removed the points will become burned so as a precaution insert old spark plugs.

The outfits on the present market are fitted with gauges and this gauge should be made to register about 12 pounds. The hose attached to the tank has at its end an injector tube. This tube is directed into the cylinder as shown in Fig. 2. The injector is controlled by a valve, in one case a trigger valve, so as to be manipulated easily. A lighted match is dropped into the cylinder and the injector tube inserted into the cylinder and moved around as much as possible so as to cover a large area. The combustion of the carbon is accompanied by sparks and perhaps a little flame from any oil with which it may be soaked. Once the carbon begins to burn the action continues without interruption as long as oxygen is being supplied. The difficulty with many has been in getting the initial burning. The use of burning matches as before mentioned is good but many state that the wax taper is better, insuring immediate burning. When the sparks cease flying the operation is finished. It is advisable after cleaning carbon to grind the valves, but this should not be done if the motor compression is good. A little oil should be poured into each cylinder and the motor turned over a few times after the operation is over, because the flame leaves cylinder and piston dry.

### No Power on Hills

**Akron, O.**—Editor Motor Age—How should the coils and carbureter be regulated to get the most power out of a Ford engine? I get a good start going up hills, but before reaching the top the power seems to die out.—C. E. Richardson.

If the hill is too steep the motor naturally will labor and perhaps stop altogether. As soon as the engine shows the effects of a pull a shift should be made to

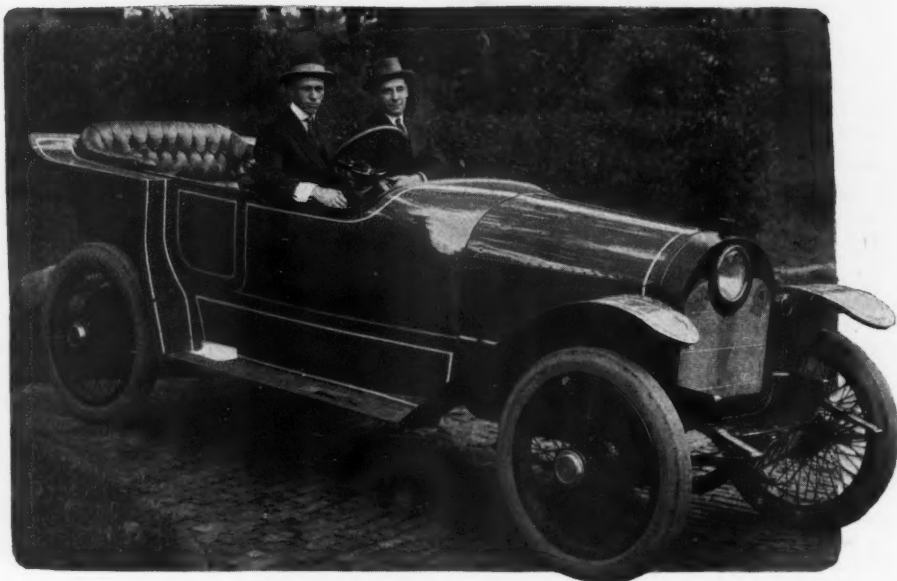


FIG. 1—CAR BUILT BY DES MOINES, IA., READER OF MOTOR AGE

first speed. If your coils give good service while the car is operating on level ground no vibrator adjustment should be made. Adjustments should be made only when there is excessive arcing at the points or when the engine misfires due to too wide or too narrow a gap between the points. If you require information on the carbureter adjustments it will be necessary for Motor Age to know what make of carbureter is installed in your car as the Ford company equips some of its cars with Holley and others with Kingston devices.

## BUILDS AN UNUSUAL TOURING CAR Fitted With a Two-Door Body—Headlight in the Center

**Des Moines, Ia.**—The car shown in Fig. 1 was built by Hal R. Wells, of this city, director of the River-to-River road. The mechanical features follow the lines of good practice, the motor being a four-cylinder, L-head of  $5\frac{1}{2}$  bore. The Hele-Shaw clutch, Warner transmission of four speeds forward, and Timken axles are used. The unique features are in the general lines of the car, the greatest width being in the center of the car and the stream lines are followed out in the construction of the rear as well as the front. The width is taken care of by a  $\frac{1}{8}$ -inch space between the two front seats, the entrance being made through two doors centrally located. Another distinguishing feature is in the arrangement of the lights. The headlight is in the center of the radiator and the sidelights are a part of the inside guard for the front fenders. No lights project from any part of the car.—Bert W. Muell.

### Owners of Racing Cars

**Penn, Ind.**—Editor Motor Age—Kindly give the names and addresses of five or six private

owners of racing cars who make it a business of racing.—A Reader.

The following men are owners of racing cars and make racing a business: E. A. Moross, English hotel, Indianapolis, Ind.; Bob Burman, Peugeot Co., Chicago; F. E. Duesenberg, Des Moines, Ia.; Alex Sloan, Case Co., Racine, Wis.; Ralph de Palma, 35 Fort Washington avenue, New York, and William Chandler, Braender Tire Co., Rutherford, N. J.

## WOOD AND DENATURED ALCOHOL Usual Adulterant in the Latter, is Benzine —Other Varied Questions

**Rockham, S. D.**—Editor Motor Age—What gear ratio has the 1911 model L. F. Regal car on high?

2—Under fair conditions, what speed will this car develop?

3—What horsepower will the motor develop at 1,000 r. p. m.?

4—Is the model D. Schebler carbureter used as standard equipment on any of the 1915 cars?

5—Where is the Duesenberg car made?

6—Are there any assembled cars on the market at the present time?

7—What speed will the Overland and Regal develop?

8—Are there any stock cars on the market selling for \$1,500 or less which will develop a speed of 60 miles an hour?

9—What is the difference between wood and denatured alcohol?—W. Andrews.

1—The model LF is equipped with a 4 to 1 rear axle.

2—About 45 miles per hour.

3—The horsepower at 1,000 r.p.m. will approximate 21.

4—The model D is not used on any of the cars announced up to the present time.

5—There is no car made for general distribution, which is called the Duesenberg, but a number of racing cars under the name of Duesenberg are manufactured by F. E. Duesenberg, Des Moines, Ia.

6—Yes.

7—The 1915 Regal and Overland will show about 50 miles per hour.

8—Motor Age knows of no car selling



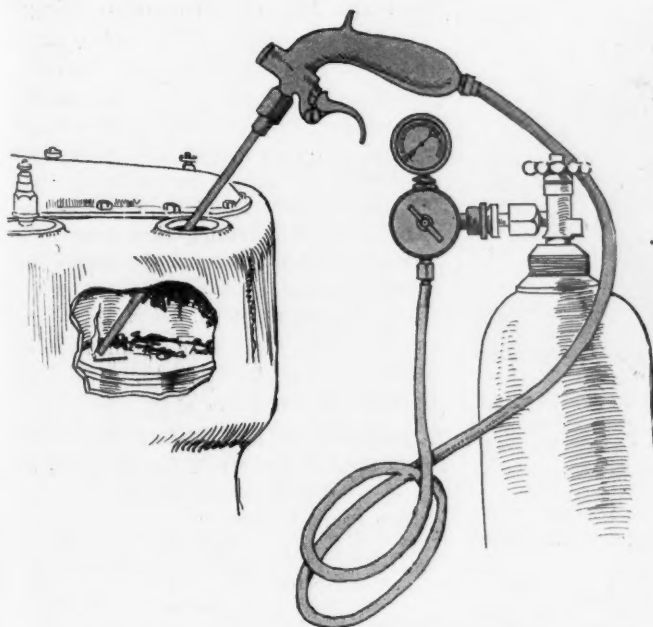


FIG. 2—METHOD OF REMOVING CARBON WITH OXYGEN  
A lighted match is first thrown into the cylinder and then the stream of oxygen played upon the piston top as shown

at \$1,500 or less which will travel 60 miles per hour.

9—Denatured simply refers to an alcohol to which some substance has been added which makes the liquid unfit for human consumption. Wood alcohol is made by the dry distillation of wood and what is sold as denatured alcohol usually is some sort of grain alcohol with benzine in solution. The addition of benzine makes the alcohol unfit for use in the manufacture of liquors but does not alter its suitability for use as a fuel. The denaturing of alcohol in this way affords a means of avoiding the high government tax on food alcohols.

#### TROUBLE WITH A DISK CLUTCH Reader States It Slips—Wants to Double Number of Plates

Olympia, Wash.—Editor Motor Age—I have a 1911 Oakland model 30 roadster. It has a disk clutch which slips or lets go entirely on a hard pull or any pull, after it gets warmed up. The oil splashes through from transmission to some extent, which has been taken into account in experimenting. No kind of oil, thick or thin, much or little, does any good. The only success comes from using heavy oil, which makes it drag bad when cold and then slip when warm. The heavy oil seems to help hold the plates until warm. All adjustments are all right and a stronger spring did not help.

The factory advised new disks, which helped for about a week, proving it is the slightly rough surfaces that tend to make the plates hold and roughing the plates is a temporary remedy.

The disks in this clutch are about  $\frac{1}{8}$  or  $\frac{1}{4}$  inch thick, alternate steel and bronze, and only about ten in number, with a diameter of about 6 inches. There is no clutch-brake.

I would like an opinion on the following: Will it help this clutch to double the number of plates, using thinner ones? Should alternate steel and bronze be used? If so, why? Could all steel be used? Can you suggest any other probable remedy whatever?—I. L. C.

Failure of the plates to grip one another is caused usually by a weak spring, worn plates or improper lubricant. You state you have used a stiffer spring, but it may not have been stiff enough. When the plates are worn you can get relief by add-

ing one or more plates but there is no necessity for doubling the number. Just add enough plates to take up the loss due to wear on the other plates. It is best to alternate steel and bronze for the wear is less when dissimilar metals, one soft and one hard, are used. All steel plates could be used and satisfactory results obtained.

Aside from the plates you might look over the thrust bearings, for if worn to any extent, may cause the trouble you mention.

Motor Age advises that instead of trying to repair the clutch yourself you allow the nearest Oakland agent to do it. If improperly reset the whole clutch can be thrown out of alignment

and then the wear on the bearings is increased.

#### Equipment for Speedy Car

Denver, Colo.—Editor Motor Age—Kindly give directions for making a Ford car speedy.

2—Where may the equipment, such as wire wheels, seats and large gas tank, be obtained?—H. B. Mahon.

1—Complete instructions for increasing the speed were given in the August 14 issue of Motor Age in this department.

2—Wire wheels may be obtained of: The Cameron Wire Wheel Co., Detroit, Mich.; Standard Welding Co., Cleveland, O.; Houk Mfg. Co., Buffalo, N. Y.; Detroit Universal Wire Wheel Co., Detroit, Mich.; Kelsey Wheel Co., Detroit, Mich., and the Presto Inter Rim Co., Boston, Mass.

Large gasoline tanks may be bought of the Janney-Steinmetz Co., Philadelphia, Pa.; Scaife & Sons, Pittsburgh, Pa.; Bush Mfg. Co., Hartford, Conn.; A-Z Co., 56th street, New York; Federal Pressed Steel Co., Milwaukee, Wis., and the Hayes Mfg. Co., Detroit, Mich.

The names of the concerns mentioned above were obtained from the Automobile Trade Directory.

Bucket seats may be bought of the Auto Parts Co., Providence, R. I.; The Times Square Auto Co., Auto Remodeling Co., and the Auto Sheet Metal Works, all of Chicago.

#### CAUSES OF BROKEN TIMING GEARS Reasons Given for Failure—Black Spots in Babbitt Bearings

Hamilton, O.—Editor Motor Age—What is it that makes black specks in rod and main bearings? They look like little holes filled with black oil.

2—Where is the Simplex car made? Give motor sizes and models.

3—What makes timing gears break?

4—How much play, if any, should there be between the piston pin and pin hole in pistons where the piston pin moves in cast iron, as in the Wisconsin motors? Kindly give answer in thousandths.—O. H. Weiss.

1—The small specks are caused by carbon being imbedded in the metal.

2—The Simplex car is made by the Simplex Automobile Co., New Brunswick, N. J. The concern manufactures four models, as follows: Model 38,  $4\frac{1}{2}$  by  $6\frac{1}{2}$ , model 50,  $5\frac{1}{2}$  by  $6\frac{1}{2}$  and model 75 has the same dimensions as the 50. All have four cylinders.

3—Timing gears may become broken because of imperfections in the metal, because of misalignment due to poor installation or warpage of the gears by operating under unsuitable conditions. This may include running without oil or running in a housing in which there are small pieces of metal accidentally dropped in or which have been broken from the gears themselves.

4—The usual clearance is .002 inch.

#### Cleaning of Reflectors

Lanark, Ill.—Editor Motor Age—Kindly tell me a good method of cleaning the reflectors of electric headlights. The dust gets in and I am unable to get them bright.—A. J. Hepner.

The best method of which Motor Age knows of cleaning headlight reflectors is by using either whiting or jeweler's rouge. The substance is rubbed over the reflector with a cloth and then wiped with another clean cloth.

#### NOISE FROM TRANSMISSION Gears May Be Out of Round—Thrust Bearings Worn

Harmony, Minn.—Editor Motor Age—There is a peculiar grinding noise in the transmission of my Hudson 33 1911 model. This noise is heard only when running on high speed and at a rate of from about 15 to 25 miles per hour. As soon as it is run at a lower speed than 15 miles, or more than 25 miles per hour the noise disappears. I have tried different kinds of grease, such as fiber grease and graphite grease, but this seems to have no effect. I have had the transmission cleaned and examined and find I am unable to detect anything wrong. It seems apparently the same now as when I purchased it. I am positive that the differential and chain-speed gears are all adjusted properly, as I just had them examined. Kindly advise me as to what is the trouble.—N. E. Anderson.

If the gears give a steady hum when the car is operated in high there may be nothing wrong with the gears. A steady hum from the rear axle is emitted by nearly all makes of cars. However, if the hum is not steady, that is, if there are stresses at intervals in the sound, the gears may be out of round. This is another way of saying that either the gears are not running true or the gears themselves are out of shape. Such a condition may be caused

#### Questions Answered and Communications Received

B. H. Boss.....Humboldt, Kan.  
C. E. Richardson.....Akron, O.  
B. W. Muell.....Des Moines, Ia.  
A Reader.....Peru, Ind.  
W. Andrews.....Rockham, S. D.  
I. L. C.....Olympia, Wash.  
H. B. Mahon.....Denver, Colo.  
A. J. Hepner.....Lanark, Ill.  
N. E. Anderson.....Harmony, Minn.  
A Reader.....Jackson, O.  
Prospective Buyer.....Jasper, Mich.  
W. J. Platten.....Green Bay, Wis.  
Sam Davenport.....Duncan, Okla.  
J. Smith.....Beloit, Wis.  
Ray Hoff.....Comanche, Tex.

No communication not signed with the reader's full name and address will be answered.

by improper initial, but more usually by tampering with, the bevel adjustments, or by the gears being allowed to operate in oil containing small particles of metal. There may be one or more teeth with high spots. It is surprising what damage dirt can do to rear axle gears. A small particle of dirt on one of the teeth may cause the gears to give an unsteady sound like that caused by gears which themselves are running out of alignment. The thrust bearings may be worn. Motor Age advises that you have the gears removed and trued up in the shop for it is almost impossible to detect the cause of an out-of-round when the gears are in the casing. If you do not wish to go to this trouble try clean lubricant, and before placing it into the case wash the case thoroughly and give the gears a good cleaning, also using kerosene freely in both instances.

#### LIGHTING GAS LAMPS WITH SPARK System Can be Made Easily—Uses the High-tension Ignition Current

Jackson, O.—Editor Motor Age—Will the Metrol car actually travel 75 miles an hour?

2—Is it possible to operate an electric lighter for Prest-O-Lite lamps, from a Splitdorf magneto?

3—Will a poor grade of gasoline cause a motor to knock?

4—What is the cause of the following on a 1912 Buick: The Splitdorf system of ignition is used and after cranking when the switch is thrown over to the magneto, it refuses to fire except occasionally and then only one cylinder will fire. It will only fire two or three, as a rule, on the battery. When running slower than 10 miles an hour only one cylinder fires, and it will only fire about every other revolution, and will not fire at all on the magneto. When running at 25 or 30 miles an hour all cylinders will fire on either the battery or the magneto. I have tried adjusting the carburetor and cleaning the breaker box and distributor but without avail. The trouble seems to be worse all the time. The spark plugs are clean.

—A Reader.

1—Motor Age does not know.

2—The illustration in Fig. 3 shows how the acetylene lamps may be lighted by using the ignition current. A wire is attached at one end either to a spark plug or any secondary wire, that is one carrying high-tension current. The other end is attached to an electrode or small piece of metal similar to the central portion of the ordinary spark plug. Another piece of metal with a wire attached is fastened so that a gap of about  $\frac{1}{2}$ -inch is made as shown in the illustration. The wires are held in place by a bracket as illustrated. One wire is grounded to a metal part of the car. Should the motor be running a spark will jump the gap and if the gas is turned on it will ignite. By concealing the wiring this may be made a permanent outfit but then a switch must be placed in the line leading to the gas burner for otherwise there would be no means of preventing the spark from continually jumping the gap above the burner. The Prest-O-Lite company, Indianapolis, makes a special outfit which permits the lamps to be lighted from the seat. Other concerns who manufacture acetylene lamp lighters are: Advance Motor Specialty Co., Chicago; Feeser Co., Indianapolis, Ind.; Ideal Brass Works, Indianapolis, Ind.; Home Light Co., Chicago; Culmer Engineering Co., Church street, New York; Menford Mfg.



FIG. 3—HOW ACETYLENE LAMPS MAY BE LIGHTED WITH A SPARK

Co., Mt. Vernon, N. Y. The names mentioned were obtained from the Automobile Trade Directory.

2—It is possible a poor grade of gasoline will cause a motor to knock. The low-quality fuel may cause slow burning in one or more cylinders. Slow burning will sometimes cause a pre-ignition knock. Continued use of a low-grade fuel may cause much carbon to deposit on the piston and this will cause a pre-ignition knock. The knock is caused by the piston striking the cylinder wall.

4—Carefully examine the wiring for in all probability there is a loose wire somewhere. Thus at high-armature speeds of the magneto there would be sufficient voltage to overcome to looseness but at low speed when the voltage is low, comparatively, the loose wire would cause a retardation in the current flow. If you find all wires in good condition and the connections tight, check up on the breaker adjustment and the spark plug gaps. Also see that the plugs are in good condition otherwise, i.e., that there are no cracked porcelains. The crack may not be visible without removing the insulator. The valves may be timed incorrectly. If the tappet clearances are too great misfiring at low motor speeds might result. How about cylinder leaks? Excess air at low speeds would no doubt cause misfiring, whereas at the higher speeds the additional air would assist in the firing.

#### WILL ENLARGE THE VALVE SEATS Change Suggested as Means of Obtaining More Power

Jasper, Mich.—Editor Motor Age—Where is the Partin-Palmer factory located?

2—What is the gear ratio of the Grant car on first speed and high or direct drive?

3—What is the approximate crankshaft speed of the Ford, Saxon, and Partin-Palmer on high speed, at the rate of 15 and 30 miles per hour, respectively?

4—Can the valves of a Ford car be increased  $\frac{1}{8}$  inch in diameter with an advantage as to power, and would the change materially weaken the engine by so doing?

5—What would be the estimate as to the rate of speed that could be obtained from a Ford car with a stripped chassis and all parts being stock with the exception of the wheels, these being 32-inch instead of the regular wheels?

5—Does Motor Age know of any company that manufactures special gears for Ford cars, that is, racing gears for differentials?—Prospective Buyer.

1—The Partin-Palmer car is made by

the Partin Mfg. Co., 47th street, Chicago.

2—The gear ratio of the Grant car is 13 to 1 on first and  $4\frac{1}{2}$  to 1 on high.

3—At 15 miles per hour all the motors you mention will turn over in the neighborhood of 700 r.p.m. and 1,400 at 30 miles per hour.

4—An increase in diameter of  $\frac{1}{8}$ -inch would result in obtaining more power. The enlarging of the seats and the valves will not weaken the engine.

5—About 45 miles per hour.

6—No. Many who have installed special differential gears have had the parts made by some machine shop.

#### BUILDING A SEVEN-CAR GARAGE Study the Law Regarding Gasoline and Oil Storage—Some Hints

Green Bay, Wis.—Editor Motor Age—Kindly give the floor plan of a private garage to have a maximum capacity of seven medium-sized cars, and to be laid out so as to efficiently care for and do repairs.

2—What head room should be left?—W. J. Platten.

1—The illustration in Fig. 4 shows the floor plan for a garage which will house seven cars and also have room for doing repair work. The repair work should be done in the rear and near the shop, which need not necessarily be divided from the garage proper, the wash rack should be stationed. Equip with long benches and be sure that there are windows above the benches. If possible construct benches with a number of drawers for holding the

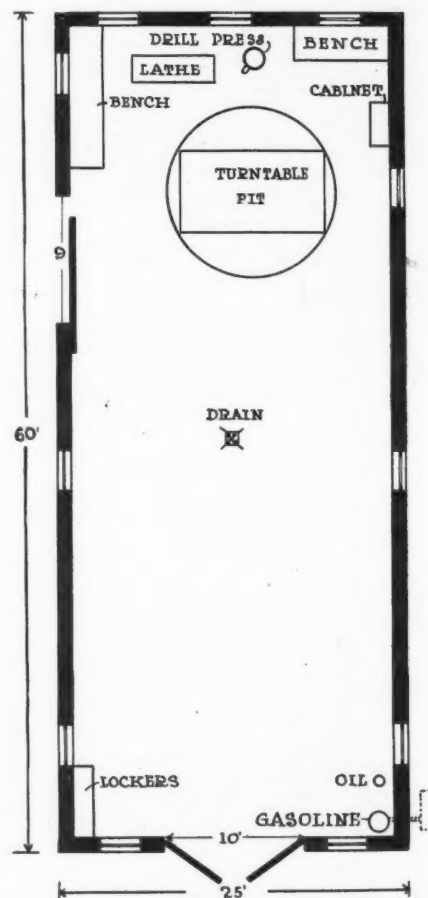


FIG. 4—FLOOR PLAN OF A GARAGE FOR HOUSING SEVEN CARS



tools, but at the same time you should have a cabinet for the safe keeping of expensive tools. Near the entrance a number of lockers or one large cabinet should be placed so that motoring apparel can be stored safely over night. The gasoline and oil, should, of course, be near the entrance. You should be familiar with the laws of your city regarding the storage of gasoline in underground tanks, for in many cases work of this sort has been done and then later reconstruction was necessary to comply with the law.

2—Nine feet of head room will be sufficient.

### TIMING THE IGNITION ON CADILLAC

#### Delco System Uses Auxiliary Dry Cells—Adjustment Method

Beloit, Wis.—Editor Motor Age—In the September 3, 1914, issue of Motor Age, appeared a diagram showing the valve timing of the Overland, Velle and Cadillac cars. Tell me how to time the ignition on the 1914 Cadillac.

2—Give the timing and magneto setting of the 1914 Reo, and Overland.

3—Give the name of a good book which would help me in the timing and setting of the valves, magneto and ignition system.—J. Smith.

1—The 1914 Cadillac uses the Delco cranking, lighting and ignition system, and both battery and magneto systems may require timing.

An ignition relay is connected in the dry battery ignition circuit and serves to break the primary circuit immediately after it is completed by the auxiliary contact mechanism in the timer, shown in Fig. 7, thereby inducing a high-tension current in the secondary circuit, which results in a spark at the spark plug. The magnet A, in Fig. 5, attracts armature B when the current is completed through the timer. This action opens contacts C, breaking the primary circuit. The condenser D is mounted beside the magnet coil.

The adjustment of the relay is at the pole piece E. This regulates the distance between the armature B and magnet pole, and the gap between contacts C. The adjustment is made by turning the notched head at E clockwise to increase, and anti-clockwise to decrease, the gap between contacts.

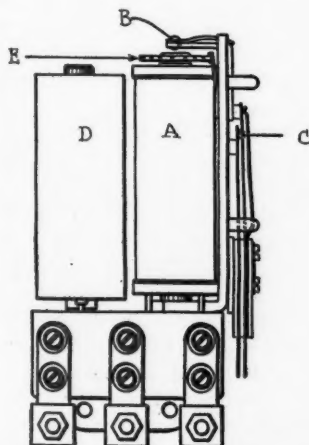


FIG. 5—RELAY OF DELCO SYSTEM IN CADILLAC SHOWING ADJUSTMENTS

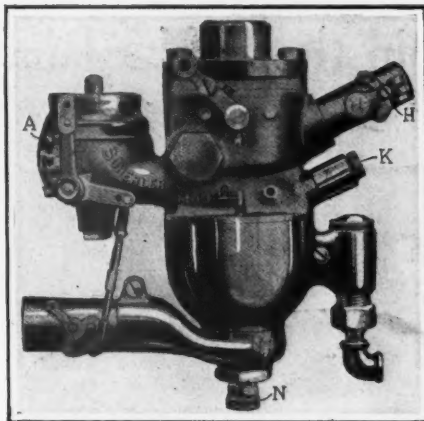


FIG. 6—SHEBLER MODEL O CARBURETER SHOWING ADJUSTMENTS

The correct distance between contacts C when the armature B is pressed down is equal to approximately the thickness of one sheet of paper on which this is printed. A very simple way in which the adjustment can be made, when the engine is running on the battery, is to turn the notched head of the pole piece in the counter-clockwise direction until the motor stops firing. Then turn it four or five notches in the opposite direction. Under no condition should the adjustment screw

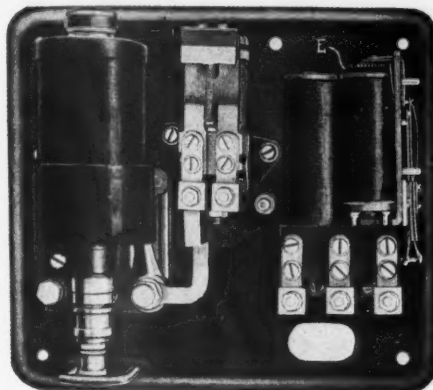


FIG. 7—SHOWING HOW THE RELAY IS INSTALLED IN THE CADILLAC

be turned very far in either direction. If the armature vibrates feebly when the start button is depressed, it indicates weak dry cells or dirt either between the relay or timer contacts.

In timing the magneto spark first crank the motor by hand until the piston in No. 1 cylinder is on dead center and the cylinder about to fire. Remove the distributor cover, also the rotor, which is above the timer, and loosen the adjusting screw A in Fig. 8, just enough to allow the cam C to be turned by hand after the rotor is fitted. The adjusting screw should not be loosened enough to allow the cam to turn on the shaft when the motor is cranked by hand.

Replace the rotor and turn it by hand until the distributing brush is approximately under the terminal marked No. 1 on the distributor cover. If the timer is

only slightly out of adjustment this will be unnecessary.

Switch on the battery ignition, hold in on the vibrator button at the top of the switch on the cowl board and retard the spark lever to its fully retarded position.

Pull the spark lever towards advance position and note the point on the sector at which the relay starts to vibrate. If the cam C is properly set the relay will start to vibrate just as the spark lever reaches the battery center marked Bat. C on the sector. If the relay starts to vibrate before the spark lever reaches battery center it will be necessary to rotate the cam slightly in a counter clockwise direction to correct the adjustment. If the relay does not start to vibrate until after the battery center on the sector is passed it will be necessary to rotate the cam slightly in a clockwise direction.

2—In the Overland, get No. 1 piston on top dead center and the cylinder about to fire, then push the flywheel dead-center mark 1 inch further. Turn the magneto armature shaft until the distributor is on No. 1 segment and the points just about to separate when the breaker box is in retard position. Slip the magneto in place when the above operations have been completed. The Reo may be timed in the same way, but some set the magneto in position when the piston is on top dead center.

3—Ignition, Timing and Valve Setting, which the Class Journal Co., Chicago, sells for \$1 is the only book of which Motor Age knows which deals exclusively with the subjects you mention.

#### Wants Welding Apparatus

Duncan, Okla.—Editor Motor Age—I have three high-pressure tanks, the dimensions being 18 by 48 inches. I would like to make an oxy-acetylene welding machine out of them if possible. Kindly give me all the information you can regarding this.—Sam Davenport.

Although it is possible to use the tanks for the construction of an oxy-acetylene welding plant Motor Age advises you buy an outfit, for it would be costly to build one and do the work properly. Tank charging is a dangerous job and should be done only with proper facilities for the work. The cost of acetylene or oxygen in tanks is so small comparatively that a home-made outfit hardly would pay.

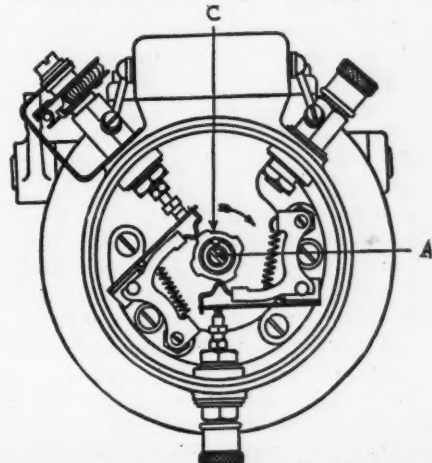
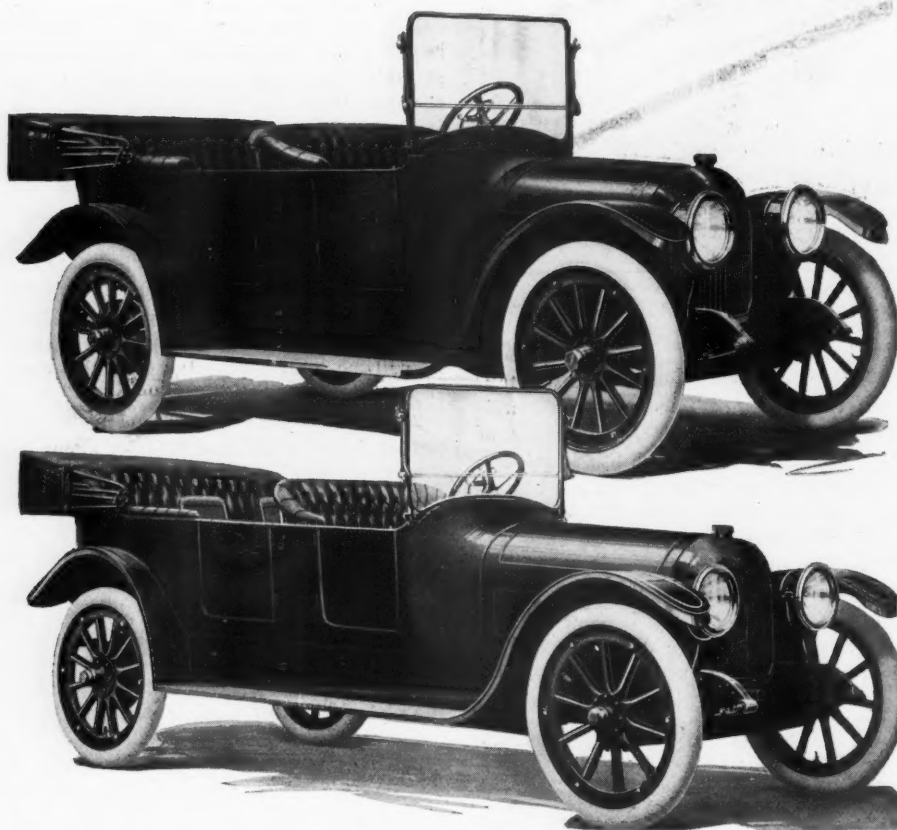


FIG. 8—TIMER OF DELCO-CADILLAC SYSTEM

# New Four and Six in the 1915 Line of Apperson Cars

Former at \$1,485; Latter at \$1,785—New Cooling System



The upper illustration is that of the new Apperson four called the 4-40 and selling at \$1,485. The wheelbase is 116 inches and the motor a 4 by 5. The lower illustration is that of the new six, the 6-45. The price is \$1,785

**T**WO entirely new cars, one a four and the other a six, have been added to the Apperson line for the 1915 season. This brings the number of models marketed by this concern to four, two fours and two sixes.

The two new cars are similar in design, although the dimensions of the motors and the wheelbases are different. The new four, which sells for \$1,485 and is known as model 4-40, is built on a 116-inch wheelbase and has a 4 by 5 power plant with L-head block cylinders. The new six at \$1,785 is known as model 6-45 and has a 3½ by 5½ motor and also has the cylinders of L-shape in a single casting.

## New Cylinder Core Work

Both these cars incorporate many features of design which have hitherto been unknown to Apperson practice. In the motor castings the core work has been so arranged that the air before reaching the carbureter is drawn through a passage cast in the exhaust manifold, and passes along the heated metal. In the six this heated air scheme has been carried out more thoroughly than in the four, as in this motor there is no exterior air pipe to the carbureter. In the four the air enters the passage in the exhaust manifold casting and is led through to the other side of the motor, and then by

## FEATURES OF THE 1915 APPERSON LINE

*Two fours and two sixes  
New cars similar in design  
Four, 4 by 5; six, 3½ by 5½  
Carbureter feeds through casting  
New water circulation system  
Cars are lighter and simpler  
Modified streamline bodies  
Bijur cranking and lighting*

means of a flexible tube to the carbureter.

Another unique feature that will be seen in the new Apperson is the method of carrying the spark and throttle linkage. As the carbureter is on one side of the engine and the magneto on the other, it is necessary to carry a transverse control rod. This has been neatly taken care of by a tube which passes straight through the motor casting, acting as a bearing for this transverse shaft.

While the suspension of the motor is the same as that of previous Appersons in that it is carried rigidly at four points, an alteration has been effected in the narrowing of the main frame, which not only provides a strong motor support with all the advantages of a sub-frame,

but also permits of a shorter turning radius.

Force feed lubrication to the main and crank bearings is continued in both the new four and six, but it has been improved in that independent force feed leads are also carried to the bearings of the camshaft. Heretofore the camshaft bearings have secured their lubrication from the oil that was thrown off by centrifugal force from the cranks but now the oil is fed to these bearings by positive pressure.

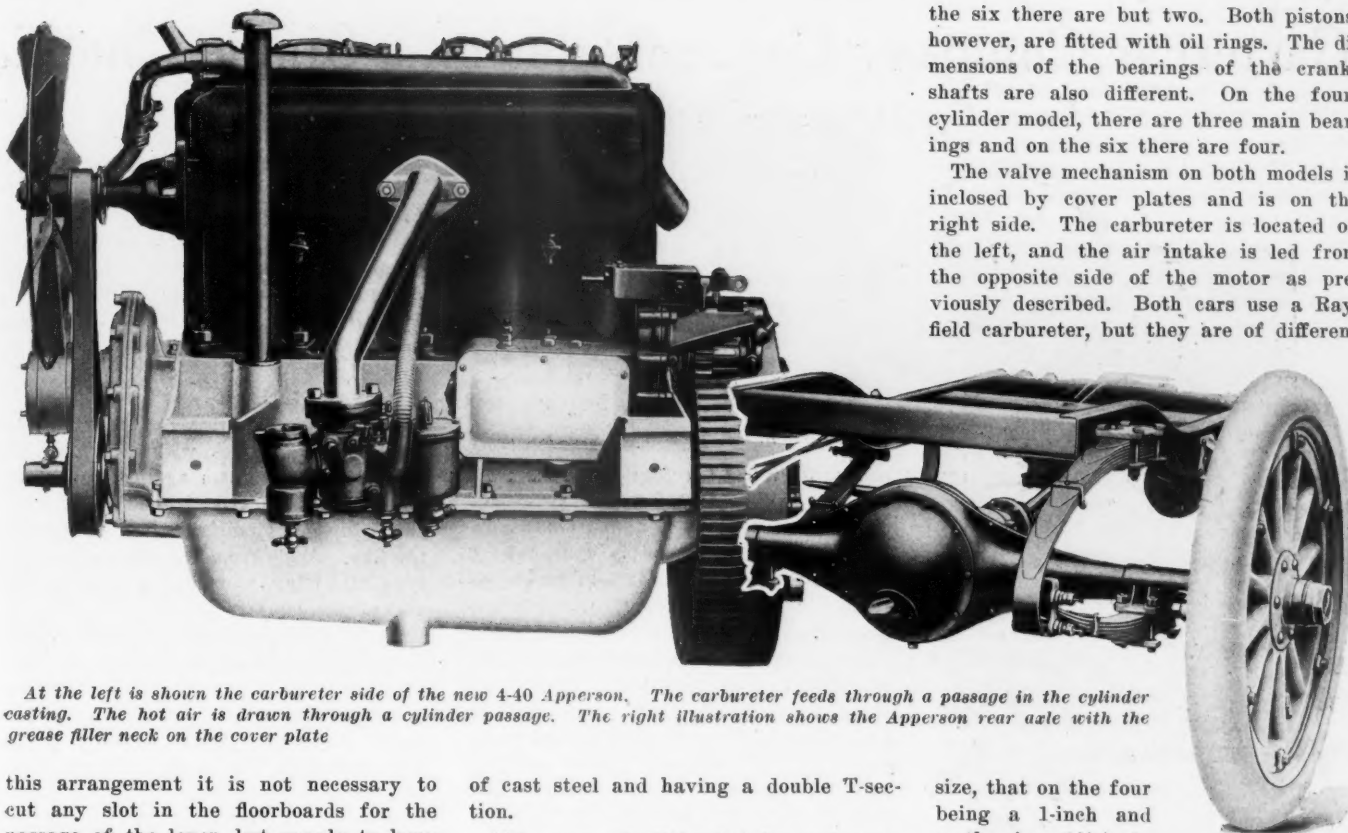
## Unique Water Cooling System

The water-cooling system on the new Appersons is different from that employed on any other American car. The water is pump-circulated by centrifugal impeller mounted in a casing forward of the timing gears. It is carried to the top of the water-jackets instead of to the bottom, as is the general practice. The casting which acts as the water outlet on the top of the cylinders is a double one, serving also the purpose of a water feeder. Baffle plates and partitions are so arranged in the cylinder casting that the water passes down on one side of the cylinder, and up on the other, forming a complete circulation. The baffling arrangement in the four differs from that used in the six. In the former the water enters the jacketing space on the left side, and flows downward to the bottom of the jacket and then up on the right side back to the radiator. On the six, the water is led along a space at the tops of the cylinders until it reaches the rear end of the motor and then passing a horizontal partition, it flows back to the forward end and then out to the radiator.

Some slight detail changes in the actual construction of the chassis will also be noticed. These are all in the line of lightening and simplifying the car. The transverse shaft which carries the brake and clutch levers is an example of this. This shaft formerly extended all the way across the frame construction. It is now only one-half its former length and is supported from the transverse angle bar that acts as the support toward the forward end of the gearbox. The method of support is by two deeply webbed bracket castings.

Practically all the brake and clutch control members are assembled directly in the gearbox cover plate. In fact, when the latter is removed it carries with it the gearshifter lever, emergency brake lever, the bearings and support for these two and the shifter forks. There is now a flexible coupling between the clutch and gearbox which takes care of any misalignment between these two units. The fulcrum of the emergency brake lever is on a direct level with the floor boards. By





At the left is shown the carburetor side of the new 4-40 Apperson. The carburetor feeds through a passage in the cylinder casting. The hot air is drawn through a cylinder passage. The right illustration shows the Apperson rear axle with the grease filler neck on the cover plate

this arrangement it is not necessary to cut any slot in the floorboards for the passage of the lever, but merely to have a large enough opening for the insertion of the pivot point.

#### Unaltered Driving Members

The rear support of the gearbox is the same as in the past and the drive members from that point back are much the same. Double universals, floating axle and double brakes still remain features of Apperson practice. A feature though that is an innovation on the new cars is that the drive is taken through the springs. The spring hangers are new, being in the case of the rear support integral with the frame gusset plates. The front brackets for the rear springs are also new, being

of cast steel and having a double T-section.

This season the Bijur lighting and starting system will be standard equipment on all Apperson cars. This is a six-volt double wire outfit, capable, according to the Apperson engineers, of spinning the new four, under ordinary conditions, at a speed of from 90 to 150 r.p.m.

On both the 4-40 and 6-45 only the five-passenger touring style is at present supplied. The bodies are of modified streamline design with a rounded radiator, having a shield-like dome top, which molds into the contour of the bonnet. The curvature of the body changes at the rear extremity of the hood and sweeps back into the body line, which is straight on the level with the tops of the doors. All the control members and the instruments are mounted on a cowl board, which is slightly in-set so as not to interfere with the knee room of the driver.

The power plants on these two new cars are similar in design, although the dimensions are different and there are many other minor differences in the actual construction. For instance, the piston rings on the four-cylinder model are three in number for each piston, while on

the six there are but two. Both pistons, however, are fitted with oil rings. The dimensions of the bearings of the crankshafts are also different. On the four-cylinder model, there are three main bearings and on the six there are four.

The valve mechanism on both models is inclosed by cover plates and is on the right side. The carburetor is located on the left, and the air intake is led from the opposite side of the motor as previously described. Both cars use a Rayfield carburetor, but they are of different

size, that on the four being a 1-inch and on the six a 1½-inch.

An Eisemann magneto forms the sole source of ignition current on both the four and six. The Bijur cranking motor is relied upon to spin the motor rapidly enough to secure a sufficiently hot spark from the magneto to ignite the charge on the coldest day.

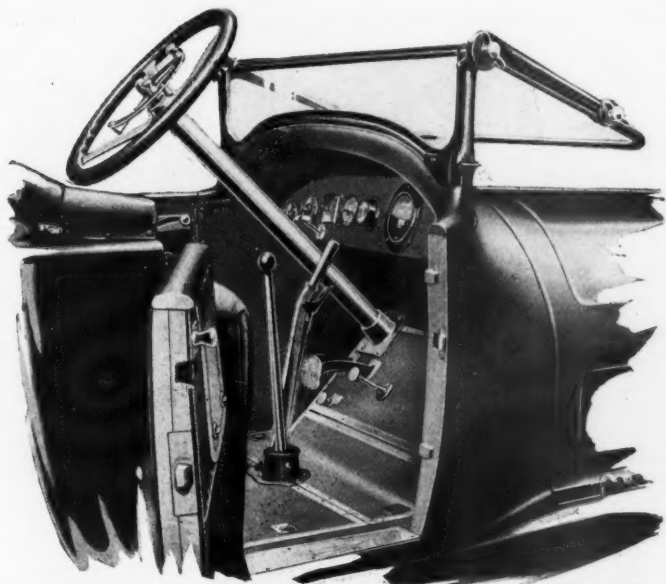
#### Band Clutch Retained

No change has been made in the contracting band clutch which has formed a part of Apperson construction for several years.

Left drive and center control is used on all Apperson cars. Equipment is full, including a one-man top with dust cover and quick-adjustable curtains, rain-vision windshield and the regular lighting and tool additions.

The two models which are carried over are known respectively as the 6-60 and the 4-45, the former being a six and the latter a four-cylinder design. These two cars are also of similar design, but vary throughout in their dimensions. On the 6-60 chassis there are three lengths of wheelbase, 134 inches for the seven-passenger touring, 128 inches for the five-passenger and 122 inches for the roadster. These three cars sell at \$2,350, \$2,200 and \$2,200 respectively.

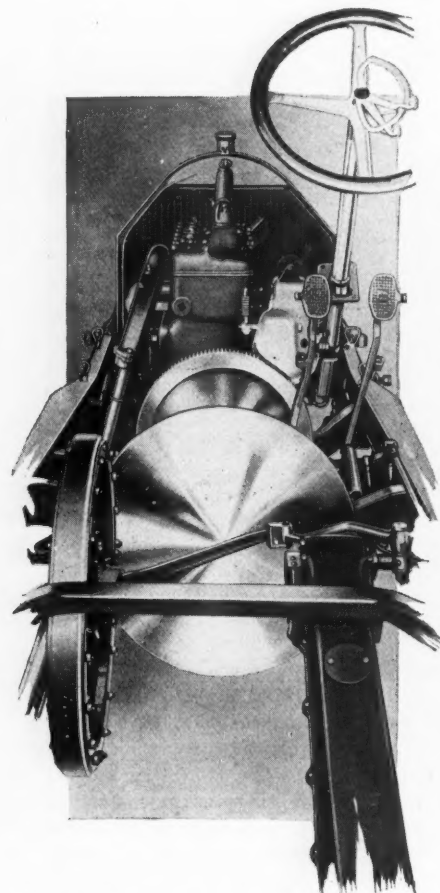
On the 4-45 there are two wheelbases, the touring car 120 inches and the roadster and coupe 116 inches. The prices on this are \$1,685 for the touring car and roadster and \$2,350 for the coupe. Both cars have T-head block power plants, the dimensions of the six being 4½ by 5 and those of the four 4½ by 5. In general chassis features they are the same as the two new cars which have been described.



Cowl board and control arrangement in the 1915 Apperson showing the cowl placed forward so as not to interfere with the knees of the driver

# Cartercar Company Concentrates on a Single Chassis

## Large Car Dropped—Improvements in Present Model



Chassis view of the new model 9 Cartercar, showing the friction-drive set

THE Cartercar Co., Pontiac, Mich., has decided to market only one model of chassis, to be known as model 9, for 1915. The previous season was given over to the manufacture of two chassis, designated as models 5 and 7, the former being higher in price and larger throughout than the latter. The new model 9 is practically a continuation of this lighter model 7, though it has undergone some refinement both mechanically as well as in outward appearance.

Friction drive, however, is practically unchanged in design or construction, it having proven very satisfactory in the hands of Cartercar users in practically its present form for several years.

### Two Bodies Supplied

There has been no change in price, the new model 9 selling for \$1,250 with full equipment, just as did its predecessor, model 7. Only two bodies are supplied—a roadster and a touring type. These are thoroughly up to date in all respects, and in changing to the full streamline form, the Cartercar gets into line with present day demands of the buying public.

Body fashion dictates a sloping hood, cowl rounding gracefully to it, round top radiator, smooth-sided body, domed fenders with protecting edges fastened with

### FEATURES OF THE 1915 CARTERCAR

*Single chassis line*

*Price unchanged*

*Friction drive practically unchanged*

*Rear axle gear ratio now 4 to 1*

*Tires and valves are larger*

*Motor more powerful*

*Body shows refinements*

concealed rivets, the elimination of side lights and so on. And in every one of these respects, the Pontiac concern has met these demands in thoroughly commendable manner.

One change in the general body construction is the addition of a door to the right or drive side. Last year there was no entrance here, and in order to accommodate this, the throw of the speed lever and emergency brake lever has been brought a little forward.

### Axle Gear Ratio Changed

The gear ratio in the rear axle has been lowered from 3.45 to 1 to 4 to 1. This makes the work of the motor somewhat easier and really gives the car more pulling power.

Tires have been increased in size from 32 by 3½ all around to 33 by 4 inches all around. In addition, the rear pair now are of the non-skid variety as against plain treads heretofore.

So as not to make any difference in the reduction ratio between motor and wheels, the copper transmission disk has been decreased in diameter 1 inch which makes up for the increasing of the tire diameter by 1 inch.

Although the motor is practically the

same in design as last season, being a 3½ by 5-inch bore and stroke size, and having its cylinders cast in a block of L-head form with detachable head, it really is more powerful, due to a slight increase of valve size and other slight changes. The valves now are 1½ inches in diameter in the clear as compared with 1¼ inches formerly.

### Wires Are Inclosed

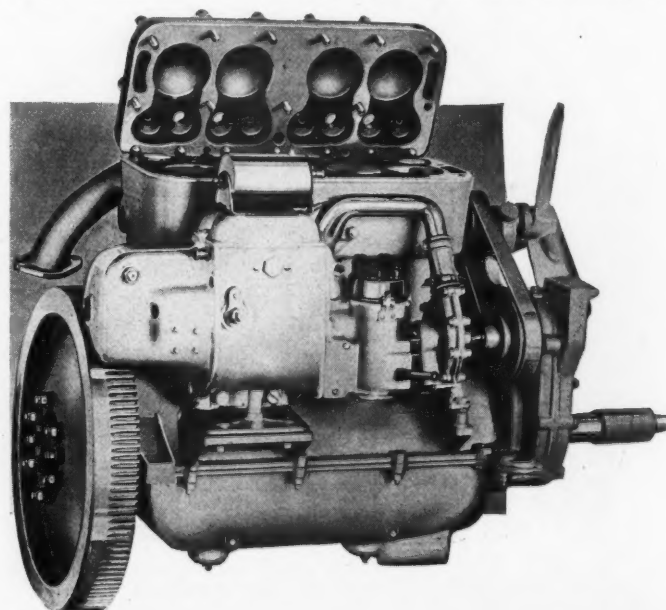
Another noteworthy refinement is the placing of all wires within flexible conduits to protect them against any of the hundred and one conditions which would result in short circuits, broken circuits and the like. Aside from the efficiency of this type of wiring, it makes a much cleaner and neater job.

The Cartercar motor is of conventional form with valves all on the left side along with the intake and exhaust manifolds, the latter running back to the exhaust pipe above the intake which is of the two-branched type. The power plant rests upon two frame cross members which are arched downward. It really is three-point suspended from these cross pieces, there being two points of attachment to the rear member by means of integral projections from the upper half of the horizontally-split crankcase, while the front of the engine rests upon the forward member at one point only.

The motor develops about 30 horsepower at 1,700 r.p.m. and its cylinder dimensions give it a piston displacement of 192.5 cubic inches while the ratio of stroke to bore is 1.45 to 1. With these dimensions it is amply large for the work it is called upon to do; performing even more satisfactorily than ever with the lower axle ratio now incorporated.

The detachable head construction is noteworthy in that it allows of the complete

The Cartercar motor showing detachable cylinder head. The valves of this engine have been increased ½ inch in diameter, making them 1½ inch. This increase in valve size has helped materially in obtaining more power





exposure of all of the pistons and cylinders together with valve pockets and valves by the removal of the steel holding bolts. Between cylinder block and head there is interposed a copper gasket to insure that there will be no leakage at the joint.

The working parts of the motor are standard in every respect, and are machined to close limits as well as being accurately balanced against vibration, which is the enemy of quietness and smooth running. There are three main bearings for the crankshaft and three for the camshaft, both of which are drop forgings of high carbon steel. The pistons are of cast iron and carry three rings each, while valves are of the standard form seating at 45 degrees, and operating through the intermediary of adjustable tappets working against the cams. The camshaft and generator and pump shaft are operated by helical timing gears completely housed at the front. There are two valve covers inclosing the valve mechanism in approved fashion, and in these covers there vents which communicate through the tappets with the crankcase and thus serve as breathers.

#### Cooling and Oiling

The cooling system is of the positive circulation type in which a centrifugal pump is employed. This is driven by the same shaft as the generator and on the right side of the engine. A large tubular radiator and three bladed, belt-driven fan do their part in the cooling.

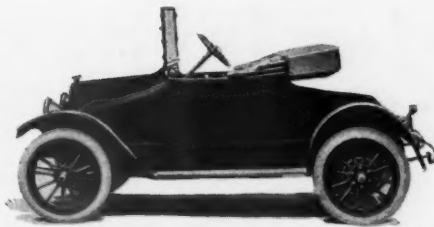
The splash system of lubrication finds efficient application in this motor. There are individual troughs under each cylinder into which the rod ends dip in their travel and throw the lubricant onto the various bearing surfaces. A plunger pump operated from the camshaft supplies these troughs with oil from the oil base and keeps them at a constant level.

The electrical part of the Cartercar is cared for by the standard form of combination Delco unit which incorporates the three functions of cranking, lighting and ignition. The ignition distributor is an integral part of the unit and the ignition current is supplied by the generator in conjunction with the storage battery.

The cranking is done by the meshing of the gears of the Delco unit with teeth cut in the rim of the flywheel when the pedal is pressed. This operation also transforms the unit into a motor, sends current from the storage battery and as soon as the pedal is released the motor-generator returns to its normal condition as a generator.

The Cartercar drive system is of very simple form. Due to the fact that it is of friction type, a clutch, which is essential to every ordinary type of car, is dispensed with as also is the gearset with its usual three speeds forward and reverse.

From the flywheel, which is not inclosed, there is a short shaft running back to the copper alloy transmission disk which has a diameter of 19¼ inches in the new car.



*The 1915 Cartercar roadster which shows that attention has been paid to streamlining*

Due to the positive connection between this disk and the flywheel, the disk rotates at the same speed as the crankshaft and is in the same plane as the flywheel.

#### Details of the Friction Drive

Back of this disk and mounted at right angles to it is the fiber-faced friction wheel, 21¼ inches in diameter. This wheel is mounted on a cross shaft on which it slides, the shaft having a bearing on either frame side member. At the right side the shaft carries a sprocket over which a silent chain runs and conveys the power back to the rear axle. Thus when friction disk and wheel are in contact, friction causes them to roll together and connection then is made between motor and rear wheels through the intermediary of the differential gears in the rear axle.

The different positions of contact between disk and wheel make different speed ratios as the transmission disk rotates faster at the outside than near the center. A lever at the driver's right, through rod and lever connection, shifts the position of the wheel in relation to the disk, and since the wheel can be put in any position along the shaft on which it slides, the speeds are infinite. The further forward the control lever is pushed, the higher the speed of driving and the further back, the slower until the wheel has finally been brought to the other or right side of the disk center, when it obviously rotates in the reverse direction, imparting corresponding motion to the rear wheels.

Of course, in order to shift the wheel from one position of contact to another, it must be brought out of contact with the disk. This is done by means of a pedal which corresponds to the clutch pedal in the car of conventional drive. Only the re-

verse action takes place when the pedal is pressed, for this forces the disk in contact with the wheel against a spring on the disk shaft, a ratchet serving to hold it in place. When the driver wishes to disengage the driving members to stop or shift, he presses the lower part of the pad of the pedal when the ratchet is released and the spring acts to bring the disk slightly forward and away from the wheel.

The construction of the drive mechanism is very substantial and efficient from a power transmission point of view. The disk shaft and housing for the driving release spring are carried on a couple of frame cross pieces, while the shaft head of them is provided with two universal joints. The driving chain running from wheel shaft to axle is fully inclosed by a housing which is split horizontally into two halves and which bolt to the differential housing through flanges.

The rear axle is of the three-quarter floating variety with bevel gear differential within the ring sprocket over which the chain runs. Single bearings are placed under the rear hubs, while Hyatt roller bearings are used on the differential. External contracting and internal expanding brakes are used with the drums bolted to the rear wheels.

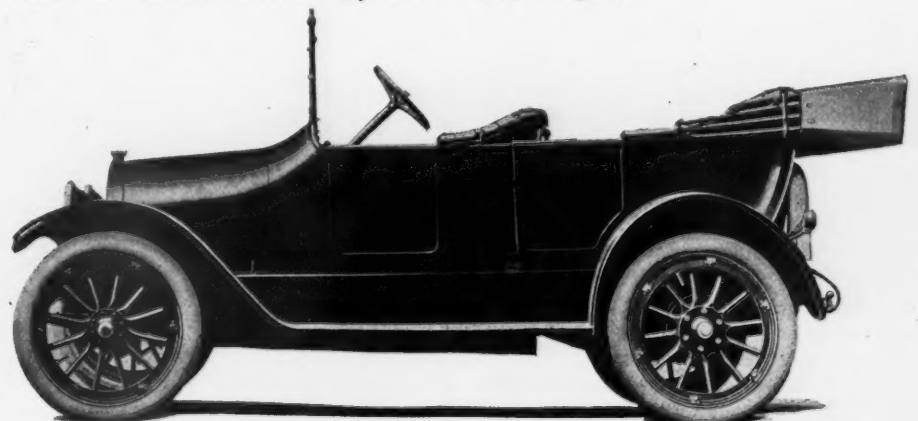
#### Springs Are Long and Flat

The spring suspension is of the easy riding form in that springs are long and flat, this being specially true in the rear, three-quarter elliptics being used and shackling outside the side frame rails.

The wheelbase of the model 9 Cartercar is the same as model 7, it being 106 inches, while the tread is the usual 56 inches with option of 60 inches for southern roads. The gasoline tank is placed at the rear and suspended from the frame, the fuel being fed under pressure to the carburetor.

Steering and control are on the right as heretofore, the gear being of the worm-and-nut type, operating from a 17-inch wheel on the top.

The equipment includes a rain-vision ventilating windshield, top with quick-acting curtains, demountable rims with one extra, electric horn, speedometer, gasoline air gauge, license tag holders, full set of tools and jack.



*The 1915 Cartercar touring car which has a new body for the coming year. This body has a door at the right of the driver, whereas the previous model of this car was not so constructed. The price is unchanged at \$1,250*

# Eisemann Brings Out New Type of High-Tension Magneto

## Magnets Covered by Sheet-Steel Housing—Departures from Former Practice

THE Eisemann Magneto Co., Bush Terminal, Brooklyn, N. Y., has placed on the market a new waterproof magneto, which is styled Type G and which differs in a number of material respects from all other Eisemann magnetos. The new instrument is of the straight high-tension type, no provision being made for battery ignition. It is made for both four- and six-cylinder motors of all sizes. It is chiefly remarkable for its extreme simplicity, the fewness of its parts and the intensity of the spark at low armature speeds.

In appearance the new instrument is quite different from its predecessors. The magnets are covered by a sheet-steel housing, which is pressed into place in such a way that the joints are perfectly tight. The distributor housing is smooth, the terminal connections being inside. In fact, the whole instrument is infinitely simpler in both construction and appearance than the older types of Eisemann magnetos.

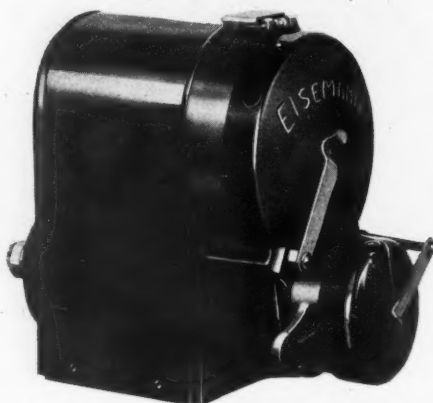
The magnets are essentially the same as have been used in the past, but due to a more efficient winding of the armature it has been found unnecessary to use double magnets. The distinctive Eisemann pole piece construction is retained. The pole pieces themselves are in the form of wedges with their thickest parts at the center of the armature, consequently the armature is at no time isolated entirely from the pole pieces.

### Advantages of the Construction

This construction causes the magnetic lines of force to be drawn from the extremities of the pole pieces toward the center of the core, which results in the entire volume of the magnetic lines of force passing through the winding without being diffused. In addition, this construction makes possible a somewhat wider range in timing the spark; furthermore, the armature acts as a keeper for the magnets and thus prevents their rapid demagnetization.

Although the armature winding in the new instrument is practically unchanged, a more efficient proportion between the secondary and the primary has been obtained. At the same time the current collecting slipring has been shifted to the end opposite to that which it occupies in other Eisemann instruments. This change has resulted in bringing all of the vital parts of the instrument to one end, where they are all readily accessible by the simple expedient of removing the distributor housing and the breaker box.

In designing the new armature a much greater factor of safety has been allowed for. Instead of being placed between two closely spaced insulating rings, the slipring R in Fig. 2 has considerable space between it and the insulating material X and



*The new Eisemann magneto has a sheet-steel housing over the magnets giving the instrument a clean and simple appearance. Simplification and reduction in the number of working parts are features of this magneto*

M at either side. At the gear end this insulating ring M is very thick, and in order to obviate the possibility of the spark jumping to the gear in the case of a disconnected high-tension lead, the insulating ring is deeply corrugated; thus its thickness is proof against the possibility of the spark piercing through and the corrugations prevent the spark jumping across the top.

The insulating ring X at the opposite side of the slipring is similar in form to that ordinarily used but is slightly thicker

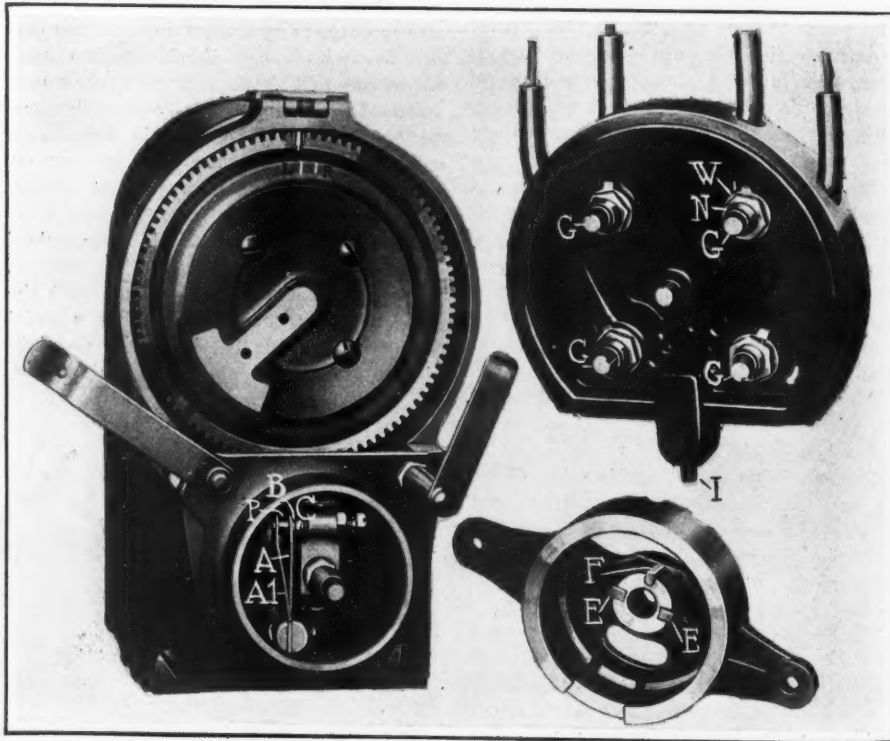
and there is considerable space between it and the ring. The slight change in wiring has permitted the use of a smaller and more compact condenser, which is housed in such a way that injury, except by direct intent, is practically impossible; otherwise the armature is standard, the core being built up of T-shaped castings pressed together with a quantity of laminations directly in the center where the magnetic flux is strongest. After winding, the armatures are shellaced and placed in an oven at 180 degrees Fahr. This process is repeated three times, after which the winding is considered to have had the last vestige of moisture removed and to be impervious to water or oil.

### Circuit Breaker Entirely New

The circuit breaker is entirely new. Instead of being a comparatively heavy arm there is a very light spring A, shown in Fig. 2, which carries one of the platinum contacts B and which rotates with the armature shaft; the other contact C is mounted in the part which supports the spring.

The auxiliary spring A1 is merely for the purpose of slightly increasing the pressure between the contact points; it is separated from the main spring by a fiber plug P in order to eliminate the possibility of trouble resulting from static conditions.

Made integral with the breaker box



*Fig. 1—View of the new Eisemann magneto partly dismantled to show the working parts. Note the new breaker mechanism housing with the fiber inserts E and the felt wick F. The spring A wipes against the fiber inserts, thus interrupting the primary circuit. The wick is used to retain lubricating oil. The distributor, the reverse side of which is shown above, has no outside connections. Carbon brushes now form the connecting link between the plug wires and the distributor arm*



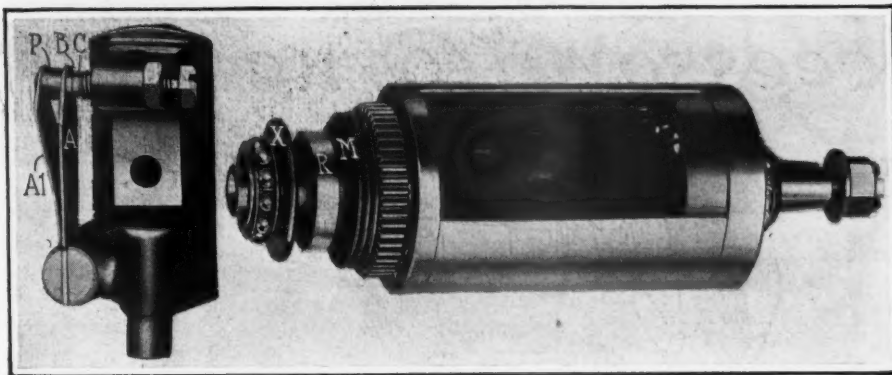


Fig. 2—The interrupter mechanism and armature of the new type G Eisemann magneto. The light spring A carries one of the contact points B. The other contact is lettered C. The auxiliary spring A1 is for the purpose of increasing the pressure between the contact points. The armature construction shows that the slipring R has considerable space between it and the insulating material X and M.

there is a small cylinder, shown in Fig. 1, with two fiber inserts E and a third felt insert F, the latter serving merely for lubricating purposes.

As the breaker mechanism rotates with the armature the spring A wipes alternately against the fiber inserts, thus making and breaking the primary circuit.

The simplicity of this mechanism is only one of its noteworthy features. As there are no bearings it is impossible for wear to cause irregular firing and as there is nothing to stick, possibility of trouble on this account is eliminated. Another valuable feature is that owing to the exceptional lightness of the parts there is no battering of contacts which, consequently, may be expected to wear a correspondingly longer time.

#### Distributor a New One

The distributor has come in for complete revision. As already has been noted, there are no connections outside. The high-tension leads enter tapered holes in the top of the distributor block, the stripped ends being wrapped around large threaded studs. Over the wire, as shown in Fig. 1, is placed a washer W, which is tabbed to prevent it from turning when the nut N is screwed down. Before the leads are attached they are forced into their respective holes, and as they are a tight fit it is impossible for moisture to enter.

The high-tension distributor contacts G, as well as the ground connection, are carbon, light springs being used to insure perfect contact with the distributor arm, shown in the same illustration. The arm is inserted in a disk, with which it rotates, touching in turn the high-tension lead contacts. The location of the current collecting slipring in its present position has made possible the elimination of a large number of parts

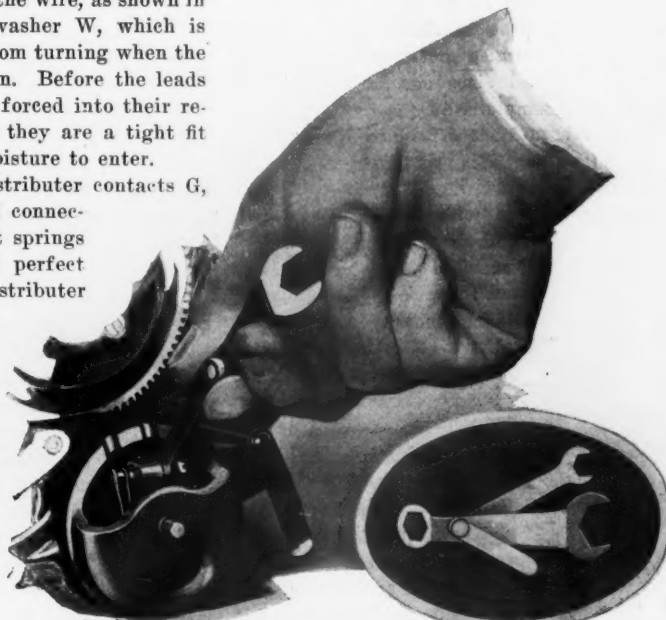
heretofore necessary. The current collecting brush I is mounted in the distributor block and is removed with it, exposing the slipring when the block is taken off. This makes it unnecessary that the current be led from one end of the magneto to the other, as has been the case in the past.

#### LINCOLN HIGHWAY PROGRESS

Detroit, Mich., Oct. 12—The Lincoln highway was 1 year old last month and the association has issued a statement as to what has been done in 12 months.

"Hundreds of miles of the Lincoln highway have been improved and marked, as well as renamed, during the past year, hundreds of thousands of dollars have been spent by the local communities and the people generally have responded with the greatest liberality to the association's call for aid," says Secretary Pardington.

"In Ohio over three-fourths of the entire length of the route has been hard-surfaced with cement, brick or other material, and the State Highway Commis-



Special wrenches for adjusting the Eisemann and how easy it is to do the work. The wrench is shown being used to reset the breaker points.

sioner, James R. Marker, has assured the fullest support of his department. In Indiana the bond issues passed by the local communities aggregate over \$350,000, this being improvement which was not even contemplated last year. On September 16, Elkhart, Ind., opened and dedicated a section of solid concrete Lincoln highway 18 feet wide; work is now in progress on a 6-mile section near Fort Wayne; St. Joseph county, in which South Bend is located, has voted \$175,000 for immediate improvement."

#### GRAND RAPIDS TACKLES TRAFFIC

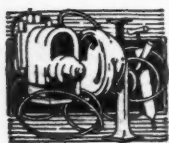
Grand Rapids, Mich., Oct. 12—The city council is considering several changes in the traffic ordinance, especially as regards the operation of motor cars. It is expected a committee of the aldermen will report at the meeting today on the results of an inspection of the traffic system of Detroit. And a most peculiar thing in regard to traffic ordinances has been brought to notice in the fact that Detroit officials have written to Grand Rapids officials asking for information on the parking system for motor cars on the downtown streets, declaring, in their belief, Grand Rapids has a splendid system.

In Grand Rapids it is the parking system that has raised a lot of the protest. At present, on some of the downtown streets cars are allowed to stand only 10 minutes. On other streets they are allowed to stand 30 minutes. An amendment to the ordinance, now before the council, would prevent cars being left standing on the downtown streets for any length of time. Another amendment being considered is for the elimination of heavy traffic from Monroe avenue, the principal thoroughfare, while still another would compel car owners to so arrange the headlights of their machines as to prevent them from blinding the driver of a car running in an opposite direction. Another amendment would compel the dimming, by means of a curtain or otherwise, of bright electric or acetylene headlights within the city.

The signals of the traffic officers also are under fire. At present the traffic officer directs traffic by a wave of the hand. It is proposed to find some other method of signaling, possibly with whistles, as is done in Detroit.

#### STUDEBAKER SHOWS PROGRESS

New York, Oct. 12—The Studebaker Corp. reports sales thus far in the new season considerably in excess of those for corresponding periods last year. Studebaker gains from coast to coast run from 25 per cent to 500 per cent. At Kansas City, for instance, its business for the first 2 weeks of September amounted to \$139,386, as against \$26,554 for the same weeks in 1913. Chicago reports \$278,433, against \$73,570; Boston, \$67,553, as compared with \$25,685, and Philadelphia, \$76,671, against \$12,635.



# The Accessory Corner



## Barnes Screw-cutting Engine Lathe

THE W. F. & John Barnes Co., Rockford, Ill., have just brought out the new 16-18-inch screw-cutting lathe shown in Fig. 2, and one of its features is that the lever movement to right or left gives four feed changes without changing gears. The feed can be reversed instantly with the lever and it also serves the cross feed of the tool carriage in the same way. The lathe is equipped with compound rest and power cross feed. The centers conform to Morse taper No. 3 and the spindle hole is of 1½ inch diameter. It cuts 1 to 56 threads and for this a set of 18 change-speed gears are provided. The rest of the equipment consists of two face plates, a center rest and two tool-steel centers. There are two sizes, one with 6-foot and the other with an 8-foot bed.

## Forest City Combination Holder

Another accessory for Ford cars, in the shape of a license pad and starting crank holder, is announced by the Forest City Electric Co., Cleveland, O. The holder is applied to the front of the car under the shackle bolt nuts. It serves to hold the starting crank handle in an upright position and also forms a support for the license plate. It sells for \$1.

## New Ford Coils

The Ford Motor Co. now is supplying new coil equipment for model T cars built previous to 1914. The new coils have tungsten instead of platinum points and are claimed to retain their adjustment for a longer period. The Ford company claims more satisfactory service can be obtained with the new coils than with the older ones. The price is \$10 if the old coils are returned.

## Edison Electric Vehicle Lamp

The Edison Lamp Works of the General Electric Co. has added a new Mazda tail-lamp to its line of electric vehicle lamps. The new lamp is of 8 watts, 24 to 90 volts of the regular concentrated filament construction. It is of 1¼-inch diameter with

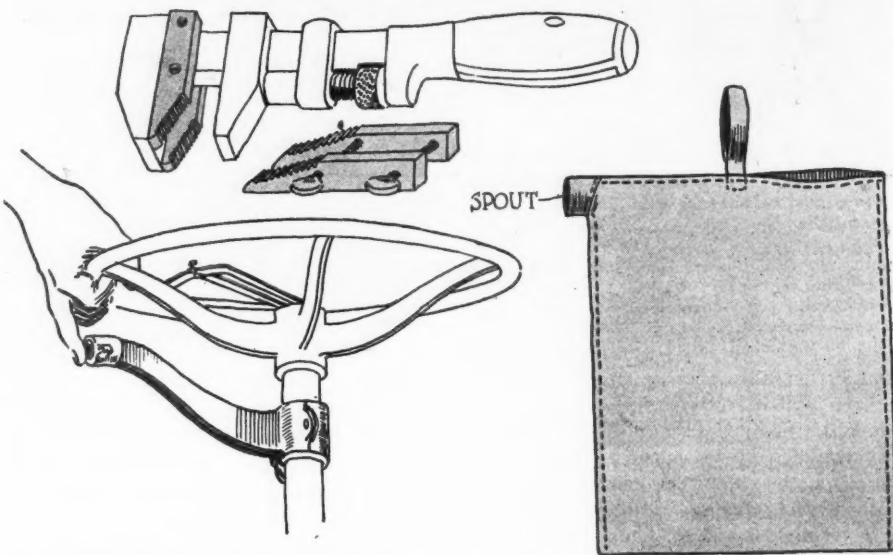


Fig. 1—At the top is shown the Yankee wrench jaws which permit an ordinary wrench being used as a pipe wrench. At the left is the Acme horn button bracket and at the right the Pillsbury Wautopail, a canvas water retainer which can be placed under the seat

a maximum over all length of 2¼ inches. It is fitted with either double or single-contact bayonet candelabra base to operate in the standard taillight.

## Acme Horn Button Bracket

A bracket which holds the horn button under the steering wheel is the latest product of the Acme Mfg. Co., Passaic, N. J. This bracket, shown in Fig. 1, brings the horn button within easy reach of the driver's hand and he can touch it without making more than one attempt. The bracket is a small arm made of aluminum and constructed so as to be attached to the steering post so there will be about 1½ inch clearance between it and the wheel. Several sizes are made and the price is \$3 complete.

## New Cameron Wire Wheel for Fords

The Cameron Wire Wheel Co., Detroit, is making a new detachable Ford wire wheel by use of which it is possible to make a change of tires on the road in 30 seconds, it is claimed. The wheel is held

in place by an outside locking nut that can be removed with an ordinary wrench. Driving is done by large taper studs which are designed to prevent the wheel from wearing loose or squeaking. Aside from the quick tire-changing feature the wheels improve the car's appearance. A set of five wheels and four inner hubs, com-

plete with bearings, brake drums and nicked hub caps, costs \$35.

## Thermoplax for Radiator Caps

A black composition known as Thermoplax is being marketed by the Cutler-Hammer Co., Milwaukee, as suitable material for radiator caps. It is said the material will withstand a temperature range from 30 to 600 degrees F. The substance is easily moulded into shape around a metal insert.

## Yankee Wrench Jaws

In order to make a double tool of an ordinary wrench, the Bon Mfg. Co., Elgin, Ill., is marketing the Yankee wrench jaws, which, when applied to an ordinary monkey wrench, convert it into a pipe wrench. The attachment is in the form of corrugated jaws, which are clamped to the wrench, as shown in Fig. 1. The attachment sells for 25 cents.

## Pillsbury Wautopail

The Pillsbury Mfg. Co., Minneapolis, Minn., is manufacturing a water pail made of canvas and which can be folded and placed under one of the car seats. The fact that it can be flattened out makes this accessory valuable for those who do considerable touring. The Wautopail shown here weighs but 8 ounces.

## Percama Top Cleaner

A liquid cleaner for mohair tops, seat covers, and similar parts, has just been brought out by the Perkins-Campbell Co., Cincinnati, O., under the name of Percama. It is claimed this substance will remove grease and oil as well as all dirt from seat covers, tops, etc., and will not cause fading of the material. It is sold in quart cans at 25 cents.

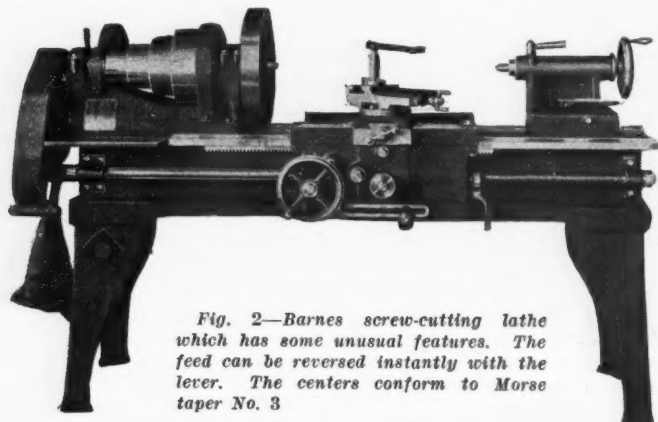


Fig. 2—Barnes screw-cutting lathe which has some unusual features. The feed can be reversed instantly with the lever. The centers conform to Morse taper No. 3



# The Motor Car Repair Shop

**W**HEN a blowout occurs on the road and no spare tube is in the car and the blown tube is beyond further repair, the usual method of procedure is to run to the nearest garage on the rim. This, in nine out of ten cases means destruction of the rim and the loss of the rim and the inconvenience caused by the accident may be eliminated to a great extent, by following the tactics of a driver who found himself in the predicament mentioned above. Instead of running in on the bare rim, the driver procured some rope from a nearby farmer and this rope was wound tightly around the rim, felloe and spokes, as shown in Fig. 2. The first few turns of rope were wound circumferentially while the remainder was wound crosswise and holding places obtained at four or five spokes. Sufficient rope was used to bring the thickness of the novel tire equal to that of the rubber casing. If properly done the rope tire will not cause riding to be very uncomfortable and in any event it is better than destroying a rim.

Many drivers, instead of using a covering of rope or other material, have been successful in saving the rim by stuffing the blowout inner tube. In a few instances grass has served the purpose well and in others old rags or other soft material, such as waste or paper, has been of value.

## Reversing in City Streets

The motorist who uses his car to take him to the office each day usually finds

## A Tire Made of Rope

sort is a store window which shows the reflections of the cars. The writer has driven a car out of a tight place merely by looking into the window, as shown in Fig. 1. Sometimes there is no window by which to judge the distance. In such cases look on the other side of the street for a well-polished car, for it may happen that such a car is standing opposite yours and in such a position as to reflect the rear

whether or not the taillight is burning. When next you drive at night look into the shop windows and see if your taillight is burning. It may mean a fine if you are caught with the light extinguished.

## Driving in the Rain

It is often said that a good driver is one who can handle his car best in emergencies, that ordinary driving with a clear road does not necessarily show driving ability, nor is there an opportunity for showing it under such conditions.

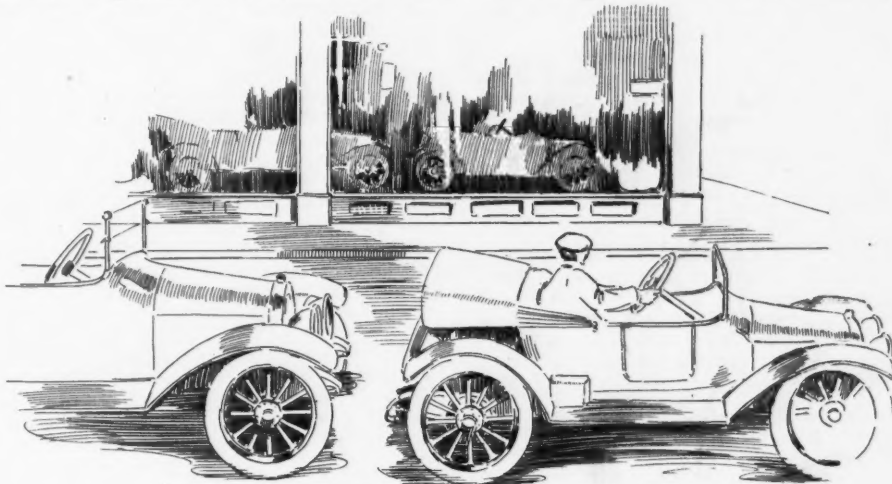


FIG. 1—DRIVING OUT OF A TIGHT PLACE

When the car is bottled up it is a difficult matter sometimes to drive out without the assistance of someone or without bumping against the car behind. The shop windows are of great assistance in locating the car behind. The windows also form a means of ascertaining whether or not the taillight is burning.

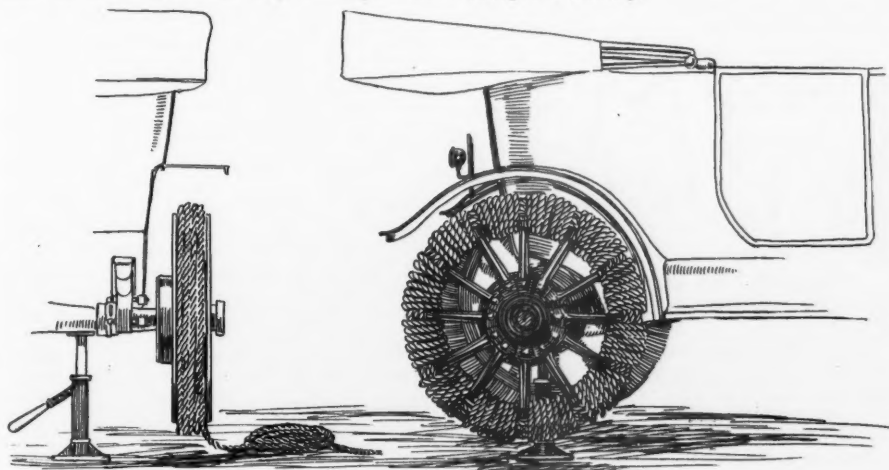


FIG. 2—GETTING HOME ON A ROAD-MADE TIRE

Should a tire blow out on the road and there be no spare tube in the car, instead of running in on the rim the above method is suggested. It consists of winding rope around the rim as shown and if tightly drawn and wound closely there will be little jarring of the passengers

when he is about to go home that his car is bottled up and only a few feet are left in the rear or front, for maneuvering. It happens often that the car behind is bumped, owing to the fact that the driver cannot see how far the rear of his car is from the front of the other one.

The most helpful thing in a case of this

wheels of your car. Limousines are helpful in such cases as this.

Looking through shop windows as a tell-tale brings up the subject of taillights. Many cars are equipped with kerosene lamps in the rear or with electric lamps which have no dash telltale. The shop windows form a very good way of noting

However, the driving ability of a man will be well brought out to a great extent on a rainy day. Recently the driver of a heavy car, one weighing close to 5,200 pounds, was driving the vehicle down a slippery street. No chains were fitted and after the car had attained a speed of about 30 miles per, it became necessary to stop within 200 feet. The clutch was thrown out, the brakes applied and the heavy car skidded in zig-zag fashion with the driver helpless. The curb was struck and a wheel thrown out of alignment. The car no doubt could have been brought to a stop and partially kept straight had the clutch been left in engagement and the brakes used intermittently. The sudden application of the brakes and the locking of the rear wheels starts a car skidding and the driver loses complete control. If the brakes are improperly adjusted the chances of skidding are greater.

In many instances it is possible to get the front wheels headed for some particular point and if it is possible to do so, they should be directed so as to mount the curb. Such action usually brings the car to a stop, but if the driver is not a good one the side of one of the front wheels will strike the curb and in the majority of cases the impact will crush the wheel.



# From the Four Winds



**JACK JOHNSON'S Car for Sale?**—The La Crosse Motor Truck Co., 106-108 North Front street, La Crosse, Wis., is offering for sale "Jack Johnson's 105-horsepower racing car, a special Thomas six, with a 5½ by 7-inch motor, at \$750."

**Tacoma Speedway Is Improved**—A large crew have about completed the work on the Tacoma speedway for this year. The straight-aways have been widened to 50 feet and the turns to 60 feet, while the track has been newly sanded, oiled and rolled the entire length of 2 miles.

**Propose San Antonio-Houston Road**—Commercial organizations and good roads associations of several counties of south Texas are actively promoting the construction of a new highway between San Antonio and Houston. The route of the proposed road is via San Marcos, Lockhart, Smithville, La Grange and a number of other towns.

**Select Minnesota Speedway Directors**—Directors for the Minnesota Motor Speedway Association have been elected as follows: Eli S. Warner, J. M. Hackney, A. W. Lindeke, St. Paul; F. R. Salisbury, J. F. Jordan, H. P. Roberts, Minneapolis. Life memberships have been bought by several men. Options are still open on two sites. The 2½-mile track will be brick, 70 feet wide straightaway and 80 feet on turns. The seating capacity will be 100,000 and the parking capacity 15,000 cars.

**Cigar Smugglers Use Motor Cars**—It is alleged by the United States custom authorities that motor cars are being used extensively for smuggling cigars and other goods into this country from Mexico. In order to put a stop to the practice the unusual method of confiscating all machines in which the contraband goods are found has been adopted. Formal notice of the adoption of this policy has been issued upon authority of the department at Washington. It is stated that even if the goods smuggled are valued at but a fraction of the car's worth, the latter will be confiscated.

**Trans-State Highway for Texas**—Preliminary steps have been taken by D. E. Colp, of San Antonio, secretary of the Texas Good Roads League and assistant secretary of the Texas division of the National Highway Association, to obtain a 100-foot right of way for a proposed asphalt highway to be constructed through the state from north to south. The route of the proposed road is from Wichita Falls, situated near the Texas-Oklahoma border, to Laredo, on the Mexico border, passing through Fort Worth, Waco, Austin, San Antonio and a number of smaller towns.

**Good Roads for Saskatchewan**—Good progress is being made on road construction in Saskatchewan according to an announcement made by F. J. Robinson, chairman of the highway commission in Regina. He stated that more than 1,500 men and 1,000 teams are now at work on the road construction. It is expected that the number of men employed on this class of work will be greatly increased within the course of another week. Of a total sum of \$1,200,000 voted by the Saskatchewan government for highways improvement, \$1,002,685.84 was spent on the roads during the year ending April 30, 1914, according to the annual report of the Saskatchewan highways commission. Of this sum \$507,517.02 was spent on road improvement direct and \$417,065.69 was spent by

municipalities under commission regulations. For steel bridges and concrete abutments there was a vote of \$300,000, the total sum spent on this class of construction being \$337,483.18.

**Motor Car Tires Contraband**—The French government has announced a supplementary list of articles declared conditionally to be contraband of war under article XXL of the Declaration of London. Among these are pneumatic and other motor car tires and the materials used in their construction.

**Massachusetts' Registrations Total 73,773**—During the first 9 months of the current year Massachusetts has issued 73,773 motor car registrations, as compared with 61,062 during the corresponding period of 1913. During the entire 1913 year but 62,660 registrations were issued. There are 88,895 persons licensed to operate motor vehicles, as compared with 73,274 in 1913.

**Price Low, So Is Gravity**—While motorists of Hartford, Conn., are rejoicing at the reduction in the price of gasoline, they are also complaining that starting is rendered difficult because of the low gravity of fuel now being sold. So much trouble has been encountered in this direction that many car owners now are paying more than the regular price for a better grade of fuel and admit frankly that they prefer to do so rather than take chances with the cheaper liquid.

**Speed Bug Bites Carranza's Son**—Victoriano Carranza, Jr., son of the notorious Mexican warrior, who is now visiting friends in Yuma, Ariz., has asked for a chance to drive a Cadillac in the Los Angeles-to-Phoenix road race. When General Carranza undertook his campaign against Huerta he offered his son a commission in the Constitutionalist army, but, to his surprise, the young man refused to take part in the war. The father called his son a coward, and since then Carranza, Jr., has been spending

most of his time in the United States. Being an enthusiastic motorist and familiar with desert driving and the Cadillac car, the young exile wishes to reinstate himself with his family by winning the Phoenix road race.

**Put Targets on Sign Posts**—To prevent hunters from shooting its road signs, the California State Automobile Association has placed a bull's eye target on each post below the road signs with the lettering, "If you must shoot, shoot this."

**Dingley Recovers from Injuries**—Bert Dingley, the race driver who was injured in the Fourth of July races on the Tacoma speedway, has returned to his home in Los Angeles. Dingley has recovered almost miraculously from the injuries sustained in the race meet. However, he lost one of his legs, which will doubtless put him out of the race game forever.

**Car Impaled by Engine; None Hurt**—Rev. W. L. Ewing, of Hoopston, Ill., while driving a motor car over the tracks of the Lake Erie and Western railroad at that place, failed to observe an approaching train. The car was struck by the engine and carried for a distance of 500 feet on the pilot before the train could be stopped. The clergyman and five little girls who occupied the car escaped with minor bruises.

**Cars Reflect Farmers' Prosperity**—That the farmers of Iowa are prosperous is indicated by the number of motor cars being registered daily with the state license department, according to W. S. Allen, secretary of state. At this time of the year the registrations generally dwindle down to only a few a day. This year in September and October the registrations have come in at the rate of fifty to sixty a day. There are but 1,000 pairs of 1914 plates left and it is likely that another order may be sent in for additional plates.

**Fords to Aid Richmond Police**—On November 5 Richmond, Va., will annex a great deal of outlying territory, including the populous suburbs of Ginter Park, Highland Park and Forest Park. In asking for fifty additional men to patrol the new territory, Chief of Police Werner has asked the police board to request the city council to purchase ten Ford runabouts. The police board will set forth the fact that the ten machines would render unnecessary the maintenance of extra police stations in the new section. The excellent service rendered by the light Ford during the past year has caused Chief Werner to regard this method of patrol very highly. The signal service corps has recently put a Ford in operation and it is giving splendid results.

**Would Improve Grade Crossing Approaches**—The Oklahoma state highway department has issued a bulletin proposing a plan for constructing the highways near approaches to grade crossing throughout the state. The proposed plan would establish a level crossing 15 feet each side of the rail and five per cent grade leading up or down from the track, making the crossings level with the remainder of the highway. Establishment of uniform grade crossings by the railroads is now before the state corporation commission. A general inspection tour over the lines of every railroad in the state by representatives of the state highway department, the railroads and the commission is planned. The advisability of the plan suggested by the highway department will be considered on the trip.

## Coming Motor Events

### SHOWS AND CONVENTIONS

Truck Co. of America, Detroit, Mich.  
October 7-17—Electric vehicle show, Grand Central Palace, New York.  
October 17-24—Show, Pittsburgh, Pa.  
October 17-30—Show, Las Angeles, Cal.  
October 19-21—Convention of Electric Vehicle Association of America, Philadelphia.  
November 9-14—American Road Congress, Atlanta, Ga.  
January 2-9—New York show.  
January 9-16—Philadelphia show.  
January 23-30—Chicago show.  
January 30-February 6—Minneapolis show.  
February 15-20—Show, Omaha, Neb.  
March 6-13—Show, Boston, Mass.  
November 3—Track meet, Brighton Beach, N. Y.

### CONTESTS

October 17—Track meet, Tulsa, Okla.  
November 3—Track meet, Brighton Beach, N. Y.  
November 8-11—Track meet, Shreveport, La.  
November 8-9—El Paso-Phoenix road race.  
November 7-8-9—Los Angeles-Phoenix road race.  
November 12—Track meet, Phoenix, Ariz.  
November 26—Corona road races, Corona, Cal.

\*Sanctioned by A. A. A.





# Among the Makers and Dealers



**HUPP Output 75 Cars Daily**—A daily output of seventy-five cars is the present schedule at the Hupp Motor Car Co., Detroit, Mich.

**Kerr Leaves Stevens-Duryea Co.**—George W. Kerr, for a number of years body engineer of the Stevens-Duryea Co., Chicopee Falls, Mass., has announced his resignation from that concern.

**Seattle Branch Builds 2,200 Fords**—A statement just issued by the Ford factory branch in Seattle shows that 2,200 Fords, worth \$1,281,347, have been assembled and completed in Seattle since last March, when the \$300,000 plant was completed.

**Buffalo Body Company Bankrupt**—With liabilities of \$8,557.46 and assets of \$2,316.41, the Up-to-Date Auto Body and Specialty Co., Inc., of Buffalo, filed last week a voluntary petition of bankruptcy.

**New Building for Braender Company**—The Braender Rubber and Tire Co. is erecting a large addition to the present factory at Rutherford, N. J., which will increase the capacity of the plant to approximately 1,000 tires and 1,000 tubes per day. The new building will be 141 feet wide by 120 feet long and built entirely of brick. It will be four stories high.

**English Agent Secures American Line**—Frank Morris, a motor car and accessory dealer from London, England, who has been in this country for upwards of 3 weeks, has secured numerous agencies for cars and parts which shows the activity towards American goods that is being manifested abroad at the present time. Among the arrangements made are those covering Salisbury axles, Zephyr carburetor, Imperial car, Scripps-Booth small car, Signal truck, and Farmer motor.

**New Process Gear to Enlarge Plant**—The New Process Gear Corp., Syracuse, N. Y., is to erect a \$100,000 addition to its plant; it is also erecting a new power plant and only 2 years ago spent \$100,000 for new buildings. The new additions will consist of two buildings, both three stories in height, and one having a two-story wing. They will house case-hardening, carbonizing and sand blast departments. Construction work will be begun early next summer.

**Franklin Sales Show Record Increase**—The Franklin Automobile Co., Syracuse, N. Y., is showing a remarkable increase in business. Shipments during August and September show an increase of 254 per cent over the same two months of last year. For September the shipments were 743 per cent over September last year. For the 3 months of July, August and September the shipments were 124 per cent over same period last year. For the 12 months ending September 30, Franklin sales were 88 per cent over the previous 12 months.

**To Promote South American Trade**—The Stegeman Motor Car Co., Sternberg Motor Truck Co., Garage Equipment Mfg. Co., Evinrude Motor Co. and Wisconsin Motor Mfg. Co., Milwaukee; the Aluminum Goods Mfg. Co., Manitowoc, and numerous gasoline engine builders in Wisconsin have joined in the movement put under way by the Merchants' and Manufacturers' Association of Milwaukee and Wisconsin Manufacturers' Association to promote trade extension in South America and other countries not directly affected by the great European war. The executive committee has raised \$5,000 to start the work. An effective plan of salesmanship is being worked out so that

solicitation of new business with foreign-tongued nations may be facilitated. Milwaukee bankers have consented to assist by working out a banking plan.

**Tire Company Increase Capital Stock**—Papers have been filed increasing the capital stock of the East Palestine Rubber Co., East Palestine, O., from \$150,000 to \$500,000.

**New Paige Advertising Manager**—Ray Tisch has been appointed advertising manager of the Paige-Detroit Motor Car Co., Detroit. He formerly held a similar position with the Haynes Automobile Co., Kokomo, Ind.

**Record Truck Order for Packard**—Through its New York branch, the Packard Motor Car Co. has received one of the largest and possibly the largest order ever received by an American concern from a foreign government for motor trucks. Within the specified period of 5 days, the Packard company must ship, or rather deliver, to the purchasers' representatives 180 trucks, of which ninety are to be of 2-ton capacity and ninety of 3-ton.

**Rolls-Royce Cars for Americans**—R. W. Schuette, American agent of the Rolls-Royce, states that he expects in the next few months to handle about fifty cars, or one-sixth of the entire annual output of the British factory. He has received about a dozen chassis and there are a number now on the way. There are twenty-seven others, either completed or in process of completion, for export to America. He states that there is a possibility of these being taken for use in the army.

**Goldsmith Injunction Dissolved**—Justice Frank C. Laughlin in special term of supreme court at Buffalo last week handed down a decision dissolving an injunction previously granted to David H. Goldsmith, of Chicago, Ill., against the International Lubricating Co., of Buffalo. The injunction sought to restrain the Buffalo company from using a secret formula originated by Goldsmith, which the company asserted had been transferred to it. The complaint of Goldsmith was dismissed later in the week.

**Changes in Klaxon Selling Organization**—The selling organization of the Lowell-McConnell Mfg. Co. has been reorganized and enlarged. The sales and advertising departments have been merged into one. Additional territorial managers have been appointed which, with other changes, will enable Klaxon makers to still further co-operate with their distributing jobbers in marketing Klaxon products. The new selling organization will direct both sales and advertising and will be in charge of a committee composed of W. O. Turner, secretary of the company; C. L. Mead, advertising manager, and C. F. Brown.

**Six Car Factories in Minneapolis**—An industrial survey by a division of the Minneapolis Civic and Commerce Association shows there are six motor car manufacturing plants in Minneapolis, eighty-eight exclusive motor car repair shops, eleven accessory manufacturers exclusively and also twenty-four gasoline filling stations outside of Bowser tanks at garages and drug stores. The employee list totals 1,437, of which 384 are in the factories, 863 in the repair shops, and 119 in the accessory plants. In the filling station work 71 men are employed. In addition six plants build electric batteries, employing 57 men. The manufacturers of cars are the H. E. Wilcox Motor Co., trucks; Ford Motor Co., general; Nott Fire Engine Co.,

motor-propelled fire and motor pumping engines; Dispatch Motor Car Co., passenger cars; Robinson Motor Truck Co., trucks; Brasie Motor Car Co., trucks and cyclecars.

**United States Rubber Co. Dividend**—The United States Rubber Co. has declared its quarterly dividend of 2 per cent on the first preferred, 1½ per cent on the second preferred and 1½ per cent on the common stock, payable October 31 on stock of record October 15.

**McCulla Leaves Packard Company**—W. R. McCulla, who has been with the Packard Motor Car Co. for several years as assistant research engineer, has resigned to become assistant chief engineer of the Knox Motor Co., Springfield, Mass.; where he will assist Frank H. Trego in the research department of the company.

**Hudson Building Landau-Limousine**—A landau-limousine is the latest addition to the line of Hudson cars made by the Hudson Motor Car Co. This new style body is built on a Hudson six-40 chassis and sells at \$2,700. This landaulet presents all the comforts of a standard limousine and the movable top may be dropped to give practically all the advantages of an open car. The top is of solid aluminum with perfect fitting waterproof joints to prevent the possibility of a leak. Leather is only used in a portion of the back quarter.

**To Invest \$50,000 in Cotton**—The Hudson Motor Car Co., Detroit, announces that it expects to invest \$50,000 in southern cotton. Each of its southern dealers has received instructions to purchase from one to five bales and, in addition, the company will buy an extra bale for every car sold in the south. The Chandler Motor Co., Cleveland, has authorized its dealers in the southern states to purchase a bale of cotton for every car sold during the next few months, either from the man who buys the car or from any source which will help the planter.

**To Manufacture Threadless Nut**—Edward Krause, of West Allis, Wis., who recently was granted letters patent on a threadless nut for bolts and axles, is preparing for a large production by establishing factory quarters in West Allis. The invention is unique, but, it is claimed, has proven successful in trials extending over a period of more than 4 years. The threadless nut is placed by hand where it is wanted and locked in place by a secret device and cannot be removed without the use of a special type of magnet. The magnet, which takes the place of the wrench, can be carried in the vest pocket and is universal to the extent that it may be used with any nut of the Krause type, either for tightening or loosening.

**Use 12,000 Tons of Steel for Rims**—C. C. Carlton, head of the rim department of the Firestone Tire and Rubber Co., quotes some astonishing figures regarding the company's rim plant. Twelve thousand tons of steel was converted into Firestone rims during the past year. It required 150,000 square feet of floor space and almost 400 mechanics to handle this tremendous volume of material. Sixteen electric welders are required. Fifteen thousand three hundred eighty-six square feet of storage space is required to carry the stock of raw steel necessary to insure prompt handling of all orders. It requires about 1,000 box cars to carry away the season's output of rims. If these cars were made up into one train, they would stretch out for almost 8 miles.

# Motor Car Agencies Recently Appointed

## PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Atlanta, Ga.	Harry Holland & Henry Collier	Regal	Grafton, W. Va.	Grafton Motor Co.	Oldsmobile
Alta Vista, Ia.	Alta Vista Auto Co.	Oldsmobile	Hannibal, Mo.	Long Mfg. Co.	Moon
Allentown, Pa.	Krause Auto Co.	Haynes	Houtzdale, Pa.	H. J. Wagner	Oldsmobile
Avon, N. Y.	H. W. Spencer	Oldsmobile	Huntington, W. Va.	F. C. Pendergast	Oakland
Auburn, N. Y.	Moon Garage	Moon	Holland, Mich.	Westrate & Brouwer	Overland
Alpena, Mich.	C. F. Steele	Studebaker	Highland, Ind.	Highland Garage	Oldsmobile
Arlington, Minn.	H. J. Moskop	Oldsmobile	Hartford City, Ind.	A. W. Tindall	Oldsmobile
Attica, N. Y.	E. J. Seagert	Oldsmobile	Hackensack, N. J.	Hackensack Auto Co.	Oldsmobile
Aberdeen, Wash.	L. A. Poulson	Oldsmobile	Indianapolis, Ind.	Higgins-Craig Co.	Hupmobile
Alton, Ill.	W. E. Winters	Oldsmobile	Indianapolis, Ind.	Indianapolis Haynes Motor Car Co.	Haynes
Aliceville, Ala.	J. V. Park	Oldsmobile	Indianapolis, Ind.	C. C. Turley	Haynes
Buffalo, N. Y.	Buffalo Kissel Kar Co.	Westcott	Independence, Ia.	J. H. Wright	Oldsmobile
Bloomington, Pa.	J. W. Wright	Oldsmobile	Jersey City, N. J.	Krone & Minnerly	Oldsmobile
Balmorhea, Tex.	Will J. Rhea	Oldsmobile	Johnson Creek, Wis.	J. C. Shekey Co.	Bulck
Bucyrus, O.	H. A. Paxton	Haynes	Kewanee, Ill.	E. J. Mosier	Maxwell
Burley, Ida.	Dr. Carl Snodgrass	Haynes	Kiron, Ia.	Kiron Auto Co.	Oldsmobile
Henning, Ill.	T. T. Cornell	Haynes	Keosauqua, Ia.	E. W. Peacock	Moon
Barry, Ill.	McVay & Lake	Haynes	Kansas City, Mo.	J. A. Garnier & Son	R. C. H.
Butler, Ind.	J. C. Brown & Son	Haynes	Kasson, Minn.	Otterness & Son	Oldsmobile
Brooklyn, N. Y.	Putnam Motor Car Co.	Moon	Kahoka, Mo.	Triple Star Garage	Oldsmobile
Braddock, Pa.	Copeland Garage	Oldsmobile	Logansport, Ind.	B. F. Conwell	Haynes
Bellingham, Wash.	A. Burgess	Oldsmobile	Lawrenceburg, Ind.	Lawrenceburg Garage & Repair	Haynes
Bridgeport, Conn.	F. H. Lyford and L. S. Ferris	Oldsmobile	Los Angeles, Cal.	Behine-Speers Motor Co.	Haynes
Brooklyn, N. Y.	C. B. Derby & Co.	Oldsmobile	Lancaster, Pa.	Union Garage & Supply Co.	Haynes
Birmingham, Ala.	Chafin Auto Co.	Moon	Lepage, Can.	Lepage Garage & Auto Exchange Co.	Moon
Centerburg, O.	I. S. Greek	Westcott	Lima, O.	H. L. Sherrick	Moon
Chicago	De Luxe Auto Service Co.	Oldsmobile	LaSalle, Ill.	Leonard Travis	Oldsmobile
Converse, Ind.	Wm. A. McDaniel	Haynes	Los Angeles, Cal.	J. J. deVaux	Herff-Brooks
Chatsworth, Ill.	T. E. Baldwin	Haynes	Los Angeles, Cal.	Hawley-King & Co.	Saxon
Center Point, Ia.	Haverly & Knight	Haynes	Los Angeles, Cal.	L. C. Buxton	Moon
Charlotte, N. C.	Ham Ross Motor Co.	Haynes	Lincoln, Ill.	Frank R. Woland	Oldsmobile
Columbia, Mo.	W. C. Bowling	Moon	Lima, O.	Lima Overland Co.	Overland
Colo, Ia.	R. W. Bronhard	Moon	Logan, O.	Main Motor Car Co.	Hupmobile
Columbus, O.	W. W. Muzzy	Oldsmobile	Little Neck, L. I.	George W. Cornell	Oldsmobile
Chicago	Gus B. Owens & J. H. Quinlan	R. C. H.	Long Branch, N. J.	John F. Bradley	Oldsmobile
Canon City, Colo.	J. J. Armstrong & Son	Moon	Lake Elmo, Minn.	A. Fazendin	Oldsmobile
Cleveland, O.	Dunham Motor Car Co.	Moon	Louisville, Ky.	Overland-Louisville Co.	Overland
Cedar Rapids, Ia.	Moon Auto Sales Co.	Moon	Louisville, Ky.	Kentucky Auto Co.	Oldsmobile
Creston, Ia.	J. F. Russell & Sons	Moon	Leighton, Pa.	Jones Garage Co.	Oldsmobile
Conneaut, O.	A. J. Doultiel	Buick	Louisville, Ky.	Van Patton Motor Car Co.	Haynes
Chatfield, Minn.	Col. A. Murphy	Oldsmobile	Los Angeles, Cal.	W. O. Hollingsworth	Case
Columbus, Miss.	Columbus Auto Co.	Oldsmobile	Minneapolis, Minn.	Northwest Haynes Auto Co.	R. C. H.
Cumberland, Md.	W. E. Robosson	Oldsmobile	Marion, Ind.	E. O. Nelson	Haynes
Colorado Springs, Colo.	C. S. Wolfe	Moon	Monongahela, Pa.	Monongahela Livery & Garage	Haynes
Columbia, Ill.	L. P. Weinel	Moon	Muncie, Ind.	A. E. Needham	Haynes
Columbus, O.	Winders Motor Car Co.	Velie	Montreal, Can.	Sevigny & Lalonde	Moon
Columbus, O.	Pausch & Seibach Wagon & Auto Co.	Auburn	Madrid, Ia.	Jones Automobile Co.	Briscoe
Columbus, O.	Michael Abel	Baker	Manitowoc, Wis.	Charles A. Streich	Oldsmobile
Douglas, Wyo.	Rice Hdwe. & Motor Co.	Moon	Marion, Ill.	Hosea W. Cagle	Oldsmobile
Des Moines, Ia.	Means Auto Co.	Moon	Mound City, Mo.	C. N. & J. Scott	Franklin
Dothan, Ala.	Douglass Baker	Oldsmobile	Marysville, Cal.	Merles Garage	Haynes
Dennison, Ia.	Dennison Auto Co.	Oldsmobile	Milford, Ind.	F. M. Neff	Haynes
Duluth, Minn.	E. W. Bradley	Oldsmobile	Milwaukee, Wis.	Milwaukee Auto Sales Co.	Briscoe
Dickinson, N. D.	E. G. Holst	Oldsmobile	Milwaukee, Wis.	Edwards Motor Car Co.	Dodge
Denver, Colo.	Mid-West Auto Sales Co.	Regal	Milwaukee, Wis.	Creek Motor Sales Co.	R. C. H.
Denver, Colo.	Mid-West Auto Sales Co.	Henderson	Milwaukee, Wis.	H. Collins	Westcott
Denver, Colo.	George A. Estabrook	Hupmobile	Milwaukee, Wis.	Schreiber-Boorse Motor Car Co.	Chandler
Denver, Colo.	Colorado Motor Car Co.	Saxon	Milwaukee, Wis.	Creek Motor Sales Co.	Apperson
Denver, Colo.	George E. Hannan	Crescent	Milwaukee, Wis.	Harry F. Krueger	Locomobile
Denver, Colo.	Cadillac Motor Co.	Briscoe	Milwaukee, Wis.	Johnson Automobile Co.	Maxwell
Detroit, Mich.	Wetmore-Quinn Co.	Saxon	Milwaukee, Wis.	Emil Estberg	Oldsmobile
Delaware, N. J.	Quig Brothers	Franklin	Minneapolis, Minn.	Northwest Haynes Auto Co.	R. C. H.
Doylestown, Pa.	George B. McLaughlin	Oldsmobile	Minneapolis, Minn.	Northwest Haynes Auto Co.	R. C. H.
Everett, Wash.	L. S. Cannon and S. F. Sherrod	Oldsmobile	Minneapolis, Minn.	Bohn Fawkes	Oldsmobile
East St. Louis, Ill.	East Side Overland Auto Co.	Haynes	Morristown, N. J.	W. H. Dutton Co.	Oldsmobile
Emporium, Pa.	Emporium Machine Co.	Oldsmobile	Montgomery, Ala.	Cole Motor Co.	Oldsmobile
Eureka, Cal.	Mercer & Way Garage	Haynes	Miami, Fla.	W. W. Charles	Oldsmobile
Ellensburg, Wash.	A. M. Wright and W. C. Westcott	Oldsmobile	Monroe, N. Y.	Monroe Garage Co.	Oldsmobile
Electra, Tex.	Pioneer Implement Co.	Oldsmobile	McCrary, Ark.	Riggs Brothers	Oldsmobile
Ft. Wayne, Ind.	D. H. Harris	Westcott	Memphis, Mo.	H. V. Smoot	Oldsmobile
Findlay, O.	Decker & Flinchbaugh	Oldsmobile	Mt. Vernon, O.	B. E. Salisbury	Oldsmobile
Findlay, O.	Decker & Flinchbaugh	Chevrolet	Meyersdale, Pa.	Keystone Garage	Oldsmobile
Findlay, O.	Decker & Flinchbaugh	King	Fitchburg, Mass.	Iver Johnson Sporting Goods Co.	Cadillac
Findlay, O.	Decker & Flinchbaugh	Briscoe	Manhattan, Ill.	Manhattan Motor Car Co.	Oldsmobile
Bucyrus, O.	Kroegel & Parsel Brothers	Overland	Mitchell, S. D.	Mitchell Auto & Supply Co.	Oldsmobile
Frankfort, Ind.	W. F. Kernodle	Haynes	New Carlyle, O.	Ullery & Forgey	Westcott
Fremont, Neb.	John Monnich	Oldsmobile	Norfolk, Va.	Norfolk Garage & Machine Shop	Moon
Ft. Worth, Tex.	Oldsmobile Sales Co.	Oldsmobile	Newton, Ia.	Woody Auto Co.	Moon
Freeport, L. I.	Columbian Brass Foundry	Oldsmobile	Nashville, Tenn.	Hager Motor Car Co.	Oldsmobile
Flushing, L. I.	J. B. Blecker	Oldsmobile	Newburg, N. J.	Meyer & Berg	Oldsmobile
Glenford, O.	H. R. Carmican	Westcott	New Germany, Minn.	New Germany Auto Co.	Oldsmobile
Greenwich, Conn.	Greenwich Garage	Oldsmobile	New York	J. G. Simmons	Oldsmobile



# Motor Car Agencies Recently Appointed

## PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
New York	Dimond-Warren Motor Co.	Herff-Brooks	Springfield, O.	Eaton Motor Service Co.	Oldsmobile
New York	DeLamater-Byrnes Automobile Co.	Krit	Steubenville, O.	Oldsmobile Sales Co.	Oldsmobile
New York	Minerva Motors Co.	Moline	Scranton, Pa.	Hill & Lydick	Franklin
New York	Stewart Automobile Co.	Lewis	San Francisco, Cal.	Reliance Automobile Co.	King
Netcong, N. J.	A. A. King	Oldsmobile	St. Louis, Mo.	Earl Hoffman	Cunningham
Newark, N. J.	Essex Automobile Co.	Oldsmobile	Seattle, Wash.	Eaton & Campbell	Dodge
New Haven, Conn.	Burns-Thomas Co.	Oldsmobile	St. Louis, Mo.	Frank R. Tate	Dodge
Newport, Minn.	Metzger Brothers	Oldsmobile	St. Louis, Mo.	James E. & L. E. Newell	Haynes
Ottawa, Ill.	F. S. Knowles	Oldsmobile	St. Johns, Mich.	W. M. Luecht	Briscoe
Ottawa, Ont.	Peerless Garage Co.	Oldsmobile	Springfield, Ill.	Quality Car Co.	King
Omaha, Neb.	Drummond Motor Co.	Oldsmobile	Springfield, Mass.	P. A. Williams, Jr.	Dodge
Oakland, Cal.	F. H. Dailey Motor Car Co.	Oakland	Tyrone, Pa.	W. H. & J. R. Davis	Haynes
Oakland City, Ind.	Campbell Garage	Paige	Tacoma, Wash.	Progressive Motor Co.	Mobillette
Piqua, O.	Mong & Dietrick	Westcott	Tama, Ia.	Thompson & Graham	Moon
Pleasantville, O.	C. F. Cloud	Westcott	Taos, N. Mex.	Dr. T. P. Martin	Oldsmobile
Pulaski, Va.	City Auto Corp.	Haynes	Trinidad, Colo.	W. G. Hall	Franklin
Pekin, Ill.	Heckman & Spongler Co.	Haynes	Tyler, Tex.	O. M. Boren	Oldsmobile
Portsmouth, O.	Hill Top Automobile Co.	Haynes	Toronto, Ont.	Croftan Storage Battery Co.	Oldsmobile
Philadelphia, Pa.	Stearns Motors Co.	Moon	Thurman, Ia.	Thurman Motor Car Co.	Oldsmobile
Pueblo, Colo.	The Western Motor Car & Truck Co.	Moon	Toledo, O.	Guy R. Ford	Oakland
Providence, R. I.	Arthur J. Feltham	Dodge	Tiffin, O.	C. L. Fifer	Oldsmobile
Paterson, N. J.	Oscar Peterson	Oldsmobile	Tacoma, Wash.	E. H. McClellan	Oldsmobile
Peoria, Ill.	J. H. Pfanz	Vulcan	Tipton, Ind.	K. C. Motor Co.	Haynes
Phoenix, Ariz.	McArthur Brothers	Jeffery	Toledo, O.	Baumgardner & Kibby	Westcott
Phoenix, Ariz.	George Hageman	Paige-Detroit	Tuscola, Ill.	Douglas County Auto Co.	Haynes
Peapack, N. J.	John Burd's Garage	Oldsmobile	Union Springs, Ala.	O. L. Hayes and S. P. Rainer, Jr.	Oldsmobile
Pittsburgh, Pa.	Oldsmobile Co. of Pittsburgh	Oldsmobile	Union Hill, N. J.	Union Automobile Co.	Oldsmobile
Pendleton, Ore.	B. F. Trombley	Oldsmobile	Versailles, Ky.	Cleveland & Co.	Westcott
Redding, N. Y.	Martin V. B. Burr	Oldsmobile	Valdosta, Ga.	John T. Roberts & Son	Haynes
Rummel, Pa.	Rummel Auto Co.	Moon	Webster City, Ia.	Parkhurst & Lavender	Moon
Rockville Center, L. I.	Herbert E. Pearsall	Oldsmobile	Washingtonville, N. Y.	Nicoll's Garage	Oldsmobile
Riverside, Ia.	H. F. Griffith	Haynes	W. New Brighton, S. I.	Columbian Auto & Motor Car Co.	Oldsmobile
Rogersville, Tenn.	D. D. Kenner	Oldsmobile	Winsted, Conn.	Roscoe Benjamin	Oldsmobile
Rome, Ga.	Louis Wright	Oldsmobile	Washington, Pa.	Washington Automobile Co.	Oldsmobile
Ridgefarm, Ill.	D. A. Jones	Haynes	Wellsburg, W. Va.	Charles H. Beall	Oldsmobile
Bethlehem, Pa.	C. C. Snyder	Westcott	Worcester, Mass.	Edward E. Allen	Trumbull
San Francisco, Cal.	Reliance Automobile Co.	King	Washington, D. C.	Semmes-Knessl Co.	Dodge
Springfield, Ill.	H. Lee Savage	Oldsmobile	West Newton, Pa.	McKenery & Britton	Oldsmobile
Sheridan, Mont.	H. R. Marsh	Haynes	Weed, Cal.	Weed Mercantile Co.	Oldsmobile
South Bend, Ind.	J. W. Nikart	Haynes	Wichita, Kans.	Callender Automobile Co.	Cadillac
St. Johns, Mich.	W. M. Luecht	Briscoe	Wolcottville, Ind.	F. P. Sanders & Sons	Oldsmobile
Skaneateles, N. Y.	G. A. Chamberlain & Co.	Oldsmobile	Washington, D. C.	Pollock Car Corp.	Waverly
Saginaw, Mich.	Fred H. Witters	Franklin	Wichita, Kans.	Arkansas Valley Automobile Co.	Chevrolet
Sharon, Pa.	Greer Auto Co.	Oldsmobile	Wellsville, N. Y.	Brown & Duke	Franklin
Sayville, L. I.	O. M. Rogers	Oldsmobile	Winnipeg, Can.	Cadillac Motor Sales Co.	Dodge
Sycamore, Ga.	Dr. H. W. Harris	Oldsmobile	Washington, Pa.	H. L. Robinson	Haynes
Saginaw, Mich.	J. P. Beck	Saxon	Wichita, Kan.	Wahl Motor Car Co.	Haynes
Santa Maria, Cal.	W. H. Crakes	Oldsmobile	Wethersfield, Conn.	J. N. Macdonald Co.	Allen
Sioux City, Ia.	H. E. Shoberg Motor Co.	Oldsmobile	Washington, Pa.	H. L. Robinson	Haynes
San Antonio, Tex.	Lawton Motors Co.	Oldsmobile	Washington C. H., O.	W. C. Sturgeon	Westcott
Spartanburg, S. C.	Elwood F. Bell	Oldsmobile	Youngstown, O.	Youngstown Auto & Repair Co.	Oldsmobile
St. Louis, Mo.	Deluxe Automobile Co.	Oldsmobile	Yuba City, Cal.	Sutter Garage	Oldsmobile
San Juan, Porto Rico	Pietrantonio & Sojo	Oldsmobile			

## Oil Companies Fight for Milwaukee's Fuel Trade

MILWAUKEE, Wis., Oct. 10—A bitter fight for supremacy in the gasoline trade is in prospect in Milwaukee. The independents and the Standard Oil Co. are about to lock horns and to the average motorist it appears that the consumer will benefit by reason of rock bottom prices for fuel. Formerly Milwaukee retail gasoline trade was controlled by garages but Standard and independents started to sell at tank wagon prices to all who would drive their cars to the warehouses. This was followed by the establishment of filling stations in the heart of the downtown district by numerous companies, practically forcing the garages out of the gasoline selling business. Most of the garagemen made little profit in handling gasoline and the fuel war will be resented by few.

Early this year the Bartles-Maguire Oil

Co., Milwaukee, erected a large warehouse and filling station at Broadway and Biddle streets, on motor row and following the custom of other companies, is selling gasoline to private owners at tank wagon prices. The Standard now has gained control of a large vacant lot on Broadway, opposite the Bartles-Maguire establishment and is erecting a concrete block warehouse. The Wadhams Oil Co. has numerous filling stations downtown and in the outskirts. The ruling prices of gasoline today are: 60 to 62 test, 12 cents; 65 to 68 test, 14½ cents; 70 test, 17 cents; 72 test, 19 cents. Here and there concerns are offering 60 test gas at 11 cents and doing a land-office business. Garages are keeping only small supplies, principally for their own uses and are maintaining prices about 3 to 4 cents over tank wagon

list. As a rule, the retail price is eagerly paid, for motorists nowadays go to garages for gasoline only in cases of emergency, when any price would be paid without a murmur.

### CRICKET IN NEW DEAL

Detroit, Mich., Oct. 10—The Cricket Car Co. of this city, manufacturer of the Cricket, has been absorbed by the Motor Products Co., maker of Flanders motorcycles, for the purpose of increasing the manufacture of Cricket cars. Two models will be manufactured by the Motor Products Co., a passenger and a commercial car, each listing at \$325. The Motor Products Co. have been building and supplying the engines for the Cricket. The company has opened an office, salesroom and service station at 762 Woodward avenue.



# Brief Business Announcements



**GREENVILLE, Mich.**—C. A. Mathison has sold his garage business to Frank Link.

**Providence, R. I.**—The Congdon & Carpenter Co. has taken the agency for Swinehart tires for Rhode Island.

**Pinckney, Mich.**—A. H. Flintoft has sold half interest in his garage to Claude Reason and the business will be conducted hereafter under the name of Pinckney Garage.

**Atchison, Kan.**—The business and stock of the Smith Auto Supply Co. has been bought by George A. King, the Main street garage owner.

**Seattle, Wash.**—The Chanslor & Lyon Co., which operates a chain of six supply stores on the Pacific coast, has opened a Stewart-Warner speedometer service station in Seattle.

**Detroit, Mich.**—Fred E. Castle has been appointed Michigan representative of the Flanders Electric Co., Inc., and will have his headquarters and salesrooms at 872 Woodward avenue.

**Kansas City, Kas.**—A branch will be established here by the Firestone Tire and Rubber Co., Akron, O. Until now the branch in St. Louis took care of the business in Kansas and Oklahoma.

**Milwaukee, Wis.**—The M. & F. Sales Co., 701 Wells street, Milwaukee, a distributor of accessories and parts, has been appointed state agent for Wisconsin for the Ahlberg Bearing Co. manufacturing New Departure bearings.

**Boston, Mass.**—The Saxon Motor Co. has been formed in Boston to handle the Saxon cars in that territory as a factory branch instead of an agency and salesrooms have been secured at 620 Commonwealth avenue with F. S. Sumner as manager.

**Columbus, O.**—R. W. White, who has been manager of the Columbus branch of the Goodyear Tire and Rubber Co., has been assigned to manage the Chicago branch. The new Columbus manager is W. W. Magill.

**Seattle, Wash.**—The White Co. has opened a factory branch in Seattle to supply the trade in Washington and Idaho, which will be under the management of E. W. Hill. Salesrooms have been established at 1514 Third avenue.

**Indianapolis, Ind.**—J. R. Craig, formerly with the Chicago branch of the Locomobile Co. of America, and George W. Higgins, a business man from Clinton, Ind., have organized the Higgins-Craig Co., and will handle the Hupmobile. Salesrooms have been opened at 544 North Meridian street.

**Minneapolis, Minn.**—R. E. McComas, who came to Minneapolis a year ago from the Chicago office of the Woods Electric Car Co. to the Owl Electric Garage Co., agent for the Woods cars, has taken an interest in the company and is now secretary and manager. J. N. Johnson is president, W. A. Simonson is vice-president and A. M. Wintheiser is treasurer.

**Detroit, Mich.**—The Gadabout Sales Co., Inc., has been formed here to sell the Gadabout light car made by the Gadabout Motor Corp., Newark, N. J. The incorporators and officers of the local sales company are: Charles F. Gazley, vice-president and general manager of the Detroit Axle Co., president; Otis Currie, president and treasurer of the Currie Machine Co., treasurer; Jasper Currie, secretary of the Currie Machine

Co., secretary. Temporary headquarters are at 45 East Fort street.

**Boston, Mass.**—The Empire Motor Sales Co. has established its own branch in Boston, securing salesrooms at 1002 Boylston street.

**Chicago.**—The United States Motor Truck Co., Cincinnati, O., has appointed J. L. Bondy as Chicago representative with offices in the Hartford building.

**Columbus, O.**—The Winders Motor Co. is the name of a new concern, organized by Wilbur Winders and Hampton Beeson, and located at 240 North Fourth street, which has taken the central Ohio agency for the Velie. Wilbur Winders is general manager.

**Stevens Point, Wis.**—The Bukolt Mfg. Co., Stevens Point, Wis., which brought out a new device known as the Highway tire strap, is planning to erect a large factory addition late this fall or early next spring. A site 74 by 150 feet in size has been purchased and tentative plans call for a 3-story structure covering nearly all of the new acreage. The concern intends to increase its capital by \$50,000, practically all

of which already has been spoken for by Stevens Point capital.

**Detroit, Mich.**—The Signal Motor Truck Co. has appointed Joseph J. Martin western sales manager.

**Davenport, Ia.**—W. J. Krull has opened a motor car supply store and a tire repair department, which is managed by K. Kahlke.

**Minneapolis, Minn.**—K. E. Corrington is the new district sales manager for the Empire Tire and Rubber Co., with headquarters in Minneapolis.

**New York.**—The New York office and salesrooms of the Braender Rubber and Tire Co. have been moved from 1987 Broadway to 250 West Fifty-fourth street.

**Minneapolis, Minn.**—H. E. Mark & Co. is the Minneapolis distributor of the Dodge car and not the Joy Bros. Motor Car Co. as stated in the September 17 issue of Motor Age.

**Detroit, Mich.**—The Detroit Accessory Co. has started in business at 870 Woodward avenue and will handle Ford specialties. This is a new company organized recently by W. M. Hogle, formerly sales manager of the Republic Motor Truck Co.

**Traverse City, Mich.**—James Purvis and Ralph Wynkoop have purchased the garage business of H. B. Montague. They will enlarge the premises, add a general repair shop and secure the agency for one or two lines of cars not represented in this section of the country.

**Manchester, N. H.**—The Maxwell Motor Sales Corp. of Boston opened a branch at 609 Amoskeag building, Manchester, N. H., which will be used as a distributing point for the cars in New Hampshire and Vermont under the direction of W. S. Oley, one of the factory men.

**Los Angeles, Cal.**—The Ahlberg Bearing Co. of Chicago has established an office and factory in Los Angeles. This company specializes in regrinding annular ball bearings. The growth of the company's business in the past 4 years has brought about the establishment of branches in New York, Boston, Cleveland and Detroit.

**Wausau, Wis.**—The Marathon Electric Mfg. Co., of Wausau, Wis., has started initial operations and is turning out a large line of electrical goods, including motors, dynamos, generators, etc., of the small type. The plant is being enlarged and a new power house erected. The company's quarters consist of the former forests products laboratory built by the government 3 years ago and abandoned last fall at the conclusion of its pulpwood research work.

**Detroit, Mich.**—Edward T. Birdsall, mechanical engineer, has been appointed manager of the Detroit office of the Emil Grossman Mfg. Co., Inc., 708 Ford building, to succeed G. Eduard Shaw. Simultaneously with the consummation of this arrangement, facilities have been provided for carrying an emergency stock of Red Head plugs for the convenience of the manufacturers situated in Detroit and vicinity. However, large shipments will continue to be made from the factory located in the Bush Terminal factory, Brooklyn. A. L. Glick, who was assistant manager of the Emil Grossman Mfg. Co. Detroit factory before its consolidation with the Brooklyn headquarters, has been appointed sales representative in Michigan, Indiana and Ohio.

## Recent Incorporations

**Akron, O.**—Mohawk Supply Co., capital stock, \$2,500; to handle rubber goods; incorporators, F. P. McGuinness, W. Hartman, C. P. Bidinger, F. J. Rockwell, G. H. Ovens.

**Chicago.**—Century Auto Top & Supply Co., capital stock, \$10,000; to manufacture and deal in supplies; incorporators, B. M. Goff, C. A. Wever, B. M. Goff.

**Chicago.**—Chicago Auto Equipment Co., capital stock, \$2,500; incorporators, H. M. Behan, E. Fantana, W. H. Dellenback.

**Chicago.**—Flanders Electric Co., capital stock, \$25,000; to deal in motor cars; incorporators, John P. O'Shaughnessy, H. L. Tohey, J. P. Rosen.

**Detroit, Mich.**—Wagner Resilient Wheel & Tire Co., capital stock, \$600,000; incorporators, Wm. F. Wagner, Wm. F. Ferguson, G. H. Karloffe, E. E. Russell, A. C. Baird.

**Detroit, Mich.**—National Electric Starter Co., capital stock, \$10,000; incorporators, T. S. Murton, H. K. Murton, F. Guy.

**Detroit, Mich.**—Berry Automobile Pump Co., capital stock, \$10,000; incorporators, C. Retter, W. W. Gunn, H. J. Berry.

**Detroit, Mich.**—United Auto Supply Co., capital stock, \$10,000; incorporators, C. L. Morgan, G. J. Morgan, M. C. Gerlick.

**Edwardsville, Mo.**—American Standard Automobile Co., capital stock, \$100,000; to manufacture motor cars.

**Hemstead, N. Y.**—Topford Detachable Limousine Co., capital stock, \$50,000; incorporators, F. C. Cadden, W. Hutchinson, J. A. McAvoy.

**Horicon, Wis.**—Horicon Truck Co., capital stock, \$100,000; to manufacture trucks; incorporators, M. Wells, B. H. Tallmadge, J. A. Dietrich.

**Little Rock, Ark.**—Butler Auto Co., capital stock, \$12,000; to deal in motor cars; incorporators, F. L. Butler.

**Louisville, Ky.**—Overland-Louisville Co., capital stock, \$10,000; to deal in cars; incorporators, J. H. Limbird, R. H. Green, C. S. Lattin.

**Milwaukee, Wis.**—Wisconsin Garage Co., capital stock, \$20,000; to deal in motor cars; incorporators, G. A. DeWitt, G. A. Daly, L. M. Kotecki.

**Milwaukee, Wis.**—Edwards Motor Car Co., capital stock, \$10,000; to deal in motor cars; incorporators, F. J. Edwards, A. A. Mueller, A. Mollerus.

**New York.**—Motor Devices Co., capital stock, \$30,000; to deal in motor car accessories; incorporators, W. A. Allen, D. Willis.

**Pittsburgh, Pa.**—Duquesne Motor Truck Co., capital stock, \$25,000; to deal in motor trucks; incorporators, H. G. Putnam, J. H. Cronkright, J. Zamechuk, W. W. Cronkright, John Sheehan.

**Seymour, N. Y.**—Spar East Co., capital stock, \$60,000; incorporators, W. H. Natter, R. E. Hallock, A. H. Seymour.

**Wilkesburg, Pa.**—Central Garage, capital stock, \$5,000; incorporators, R. R. Highberger, A. H. Durborrow, E. J. Boyles.



# Opportunity

THERE are more than 400,000 motor cars, on the public streets, day in and day out, equipped with the inefficient and unreliable bulb horn.

And there will be in the neighborhood of 400,000 motor cars manufactured and sold this coming year that will be equipped in the same unsatisfactory manner.

Safety to the drivers of these cars and to the general public will demand that these 800,000 motor cars be equipped with a reliable and unfailing warning signal.

The Warning Signal that will receive the big portion of this business will be the Sparton.

Because the Sparton is unquestionably the most efficient electric warning signal manufactured.

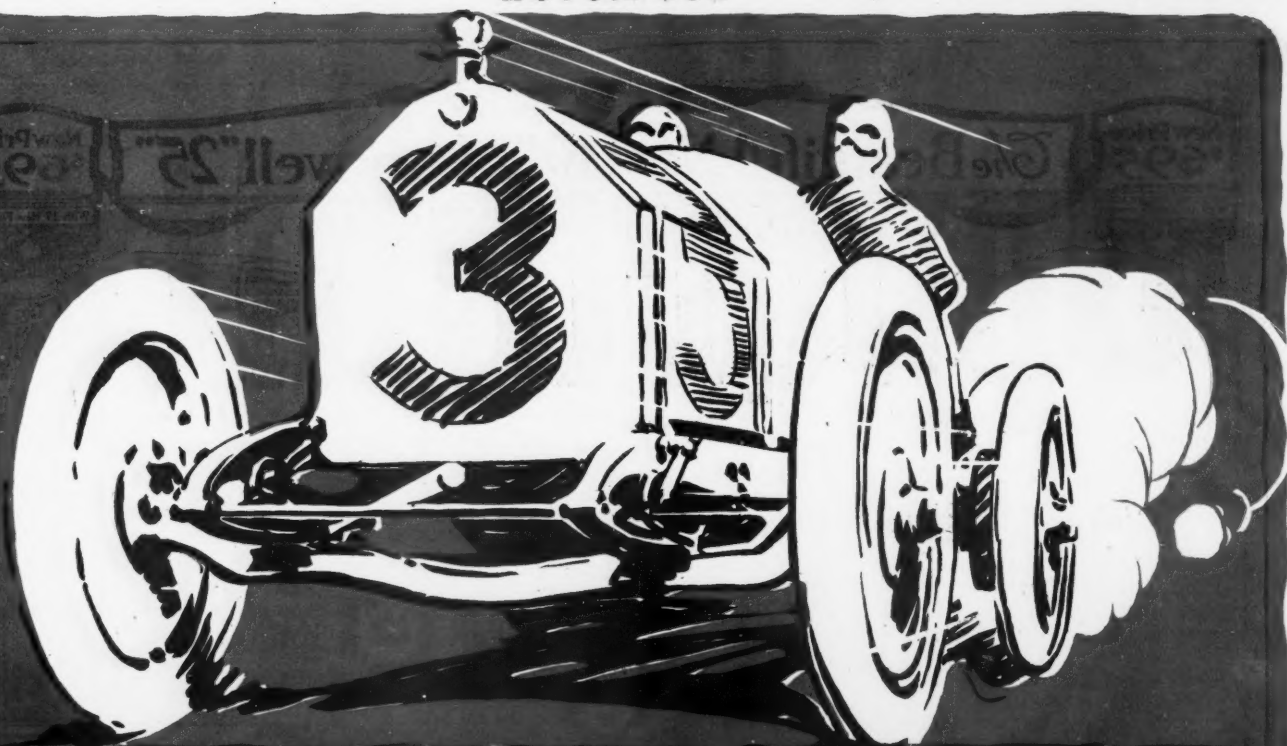
Because the selling price of the Sparton is much lower than that of any electric warning signal, with a reputation back of it, in the market.

Because practically ninety per cent of motor cars sold equipped with an efficient warning signal are Sparton equipped.

Our big advertising campaign is now in full swing—and is creating a great demand for Sparton Warning Signals.

Here is a wonderful opportunity for you to "cash in" on Sparton business. Send at once—now—for complete information.

**Sparks-Withington Company**  
**Jackson, Michigan**



# SCHEBLER

WORLD'S-RECORD-CARBURETOR

STANDARD  
EQUIPMENT  
ON-AMERICA'S

# CHAMPIONS

..

...

..

## WHEELER AND SCHEBLER

INDIANAPOLIS

INDIANA U.S.A.



**New Price \$695**

With 17 New Features





## The Beautiful New 1915 Maxwell "25"



Holds the Road at 50 Miles an Hour

### The Sensation of the Automobile Year

The biggest automobile value ever offered for less than \$1,000 Our production of 60,000 cars makes the new price of \$695 fully equipped (with 17 new features) possible.

#### Here are the Seventeen New Features

- 1—Pure stream-line body. 2—Adjustable front seat. 3—New high-tension magneto. 4—Three-quarter elliptic rear springs. 5—Five breakers on valve. 6—Spring tension fan. 7—Aluminum carburetor. 8—Close Vision Wind Shield. 9—Powerful horn, mounted on front and rear. 10—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 11—Improved steering knuckles and chassis mounted on standard under steering wheel, chassis frame bottom mounted on end of quarter. 12—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 13—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 14—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 15—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 16—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.
- 17—New 1915 Maxwell is 6000 lbs. more light than ever put in an automobile before for less than \$1,000.

With Electric Self-Starter and Electric Lights \$55 Extra

The new 1915 "Wonder Car" is on display at Maxwell dealers. See it at once. If there is no dealer in your town write or wire us, send your name and address for the New 1915 Catalog.

Maxwell Motor Co., Inc., Detroit, Mich.

**New Price \$695**

With 17 New Features





## More than 37,000 "1915" Maxwells Ordered Within Six Weeks After August 1st

On August 1st, the double page newspaper announcement—reproduced in miniature above—announced the 1915 Model Maxwell "Wonder Car." It was published in the leading newspapers of America and was followed by Maxwell page advertising in this and other prominent national publications.

Within six weeks after August 1st, more than 37,000 Maxwells were ordered by dealers. Everything indicates that, by the time this is printed, orders for at least 50,000 Maxwell cars will have been received.

This tremendous demand proves that the public and automobile dealers have recognized the 1915 Model Maxwell as the biggest automobile value ever offered for less than \$1,000.

The Maxwell Motor Company is now shipping 800 cars a week to dealers. Within a short time, this production will be increased to 1,200 cars per week. To be sure of prompt delivery, go to the Maxwell dealer nearest you and order your Maxwell now.

### 5-Passenger Touring Car \$695

2-Passenger Roadster \$670      Maxwell Cabriolet \$840      Maxwell Town Car \$920  
Any Model Equipped with Electric Self-Starter and Electric Lights \$55 extra

**"Holds the Road at 50 Miles an Hour"**

**\$695**

We are just at the beginning of a new season; territory is fast being allotted, but in some localities there is still room for the type of dealer we desire. Yours may still be open. Address Sales Department, Desk E.

Which is the Most Profitable—Promises or Deliveries?

**MAXWELL MOTOR COMPANY, Inc., Detroit, Mich.**

**\$695**



# Does It Again!

*This Time On An OVERLAND*

*24.2 miles per gallon! 3 miles per hour on high.*

## Here is the Whole Story

**Model G Rayfield Carburetor Breaks Records on New Model 80 1915 Overland Touring Car carrying four passengers**

**Economy**—24.2 miles per gallon of fuel.

**Low Throttling**—3 miles per hour on high, without missing.

**Acceleration**—From standing start to 30 miles per hour in 12 1-5 seconds.

**Speed**—42 miles per hour.

**High Climb**—Hubbard's Hill—one of the worst hills in the middle West. From 12 miles per hour on high at the base to 20 miles per hour on high at crest, without shift of gears.

Throughout these tests there was no carburetor adjustment whatever, even from the dash.

Weight of car with four passengers, 3,620 lbs. Gasoline test 59°. The electric generator, too, was consuming power throughout the run.

## The Test Was Made Officially

**By Men Who Know**

**F. E. EDWARDS, Chairman Technical Committee, Chicago Automobile Club,**  
Assisted by

**S. D. HIRSCHL, Chairman Technical Committee, Chicago Motor Club.**

As an exhibition of the all-around efficiency of a carburetor, this record has never been approached except by previous Model G Rayfield tests on other cars.

The results only further prove the superiority of the Rayfield carburetor and what an owner may expect on any other car Rayfield-equipped.

## What Will the Rayfield Do Next?

Tell us what car you own and we'll tell you what we guarantee the Model G Rayfield to do.

**Findeisen & Kropf Mfg. Company**

2109 Rockwell Street

::

::

::

::

Chicago, Illinois





The



## Storage Battery

Band Wagon Is 85% Filled

The manufacturers of only 15% of the electrically equipped cars made in the United States have failed to see the light.

We don't expect all of them to ride with us—we would prefer that a few should buy the other fellow's storage batteries—it stimulates us to continued effort and by comparison shows just how good the **LBA** really is.

**WILLARD STORAGE BATTERY COMPANY**  
CLEVELAND, OHIO

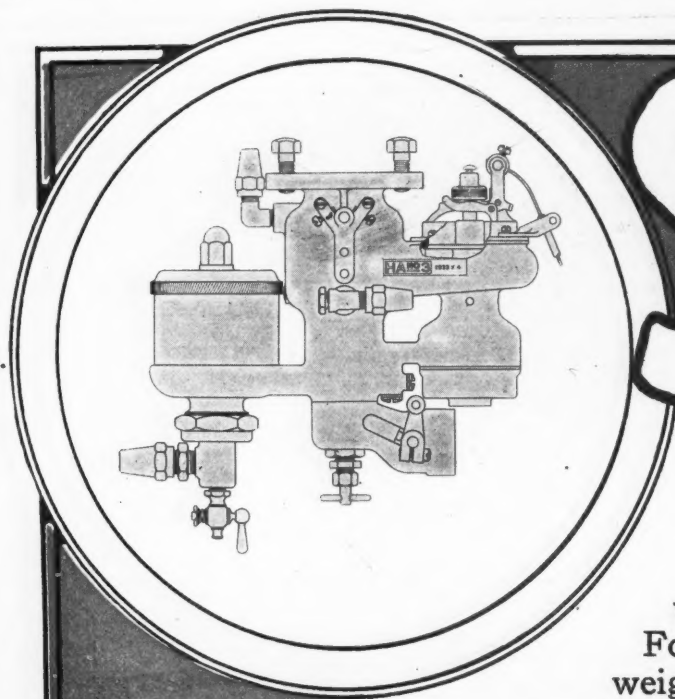
New York Branch: 228-230 W. 58th St.  
Chicago Branch: 2241 Michigan Ave.

Indianapolis Branch: 318 North Illinois Avenue

Detroit Branch: 736-740 Woodward Ave.  
San Francisco Branch: 821 Monadnock Bldg.

SERVICE STATIONS IN ALL PRINCIPAL CITIES IN THE UNITED STATES, CANADA AND MEXICO

(118)



# STROM

## Stock Cole 4-Cylinder Model Economy

Saturday last, at the Indianapolis Speedway, a Stromberg-equipped stock model Cole Four touring car, carrying seven passengers and weighing 4390 pounds, established a new world's economy record by traveling 24.135 miles on 1 gallon of fuel—equivalent to 53 ton miles per gallon.

## 24.135 Miles on One Gallon of Fuel

Altogether six economy trials were made, Stromberg averaging throughout 22.465 miles per gallon of fuel, or 43.21 ton miles per gallon, a performance remarkable in itself when the adverse weather conditions are taken into consideration, and the further fact that the first four of these trials were made without hot air equipment.

Following the economy test a 30-minute speed trial was made in which the Stromberg-equipped Cole averaged 55.63 miles per hour—

proof sufficient that the carburetor was just as speedy as it was economical. "The consistent running of the car during this test was the most noticeable point. The weather conditions were threatening throughout," so reads the A. A. A. official report. Two of the above trials were made during thunder showers.

The above tests were official—sanctioned by the American Automobile Association—and under strict supervision of the Association's technical representatives.

### The Field Record

#### OFFICIAL FIELD RECORD

Cole Standard "Four" Trials on Indianapolis Motor Speedway, conducted under Sanction A. A. A., October 8th, 1914.

	Trial No. 5	Trial No. 6
Finish, Miles....	24.426	24.135
Total Weight with Pass.....	3650.	4390
Ton Miles per gallon .....	44.6	53.0
M. P. H.....	24.55	24.75
Temperature Conditions.....	70° F— 70° F Shower	72° F— 71° F

#### HALF-HOUR SPEED TRIAL

Miles in ½ hour.....27.815  
Equivalent to.....55.63 M. P. H.

(Signed)

O. K.—F. E. E.  
O. K.—C. S. R.

## STROMBERG MOTOR

New York  
Indianapolis

BRANCHES  
Boston

Detroit  
Minneapolis  
Distributors and Service Stations

# DID



# BERG

## Establishes New World's Record

The results from this test conducted by the Cole Company simply bear out the assertion we have made continually for the last five years: **IF YOU WANT ECONOMY YOU WANT A STROMBERG.** The carburetor used in this test was a new model Stromberg H2, 1¼-inch size—a masterpiece of all-round efficiency.

## Car weight with 7 Passengers, 4390 Lbs.

Only by figuring ton miles per gallon of fuel can the **true** economy of any car be determined. The mere statement that a car gets 25 miles per gallon of fuel is absolutely meaningless unless the car's **weight** is known and considered. A simple formula for determining your car's ton mileage—its **real** economy—is as follows: Ton miles equal the total weight of your car multiplied by the distance traveled on one gallon of fuel, divided by 2,000 pounds (1 ton); or

$$\text{Ton miles} = \frac{\text{Weight of car} \times \text{distance traveled}}{2,000 \text{ lbs.}}$$

Figure out the results on your own car and compare them with the 53 ton miles developed by the Stromberg-equipped Cole.

Consistent performance, rock-bottom fuel economy, and a world of speed under the worst as well as the best conditions—these are Stromberg attributes.

Demand that your new car be Stromberg-equipped—install an economical Stromberg on your old car.

### WESTERN UNION TELEGRAM

Indianapolis, Ind., Oct. 12, 1914.  
Stromberg Motor Devices Co.,  
64 East 25th Street, Chicago, Ill.

A strictly stock standard Cole, four cylinder model, fully equipped, carrying seven passengers, with Stromberg Carburetor, which is regular equipment on all Cole models, established world's fuel economy and speed trial records here on Indianapolis Motor Speedway. The Cole traveled over twenty-four and one-eighth miles on a single gallon of gasoline. In the speed test the Cole showed wonderful consistency in Half Hour Non-Stop Run, averaging fifty-five and six-tenths miles an hour, wavering from this consistency only a slight fraction in one lap. Tests were conducted under the auspices of the Contest Board of the A. A. A. and the Indianapolis Motor Speedway.

COLE MOTOR CAR CO. 830P

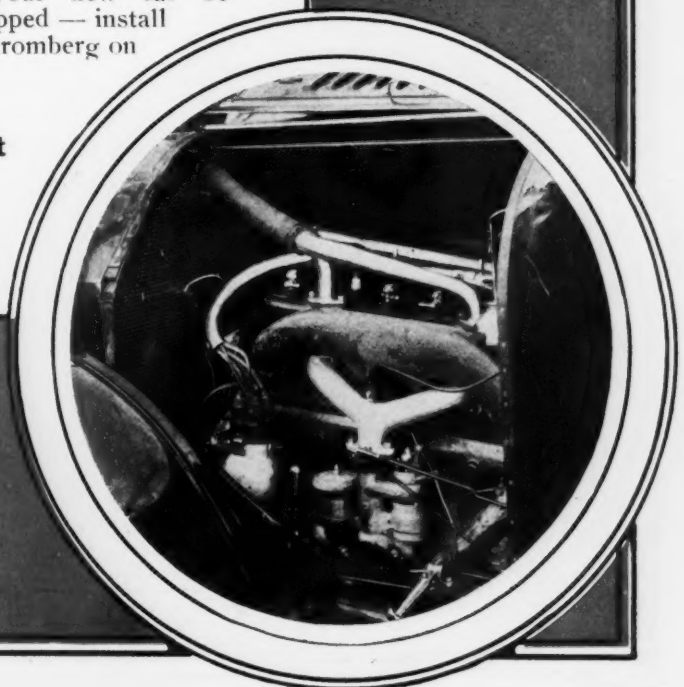
Under  
the Hood

OR **DEVICES CO.,** 68 East 25th Street  
Chicago, Ill.

DISTRIBUTING BRANCH: Chanslor & Lyon Co.—San Francisco, Los Angeles, Fresno, Portland, Seattle, Oakland.

in all Principal Cities of U. S.

# IT!





## HESS-BRIGHT LITIGATION

HESS-BRIGHT PATENT BROADLY  
SUSTAINED IN ACTION AGAINST  
F. & S. BY U. S. CIRCUIT COURT  
OF APPEALS REVERSING A  
LOWER COURT.

PHILADELPHIA, PA.,  
OCTOBER 7, 1914.





# ANNOUNCING!

*All-Purpose  
Four and Six*

*Peerless*

## The Latest European Specifications and "Peerless" Quality for \$2,000

How This Car Compares with the Average of 39 of the  
Leading European Models!

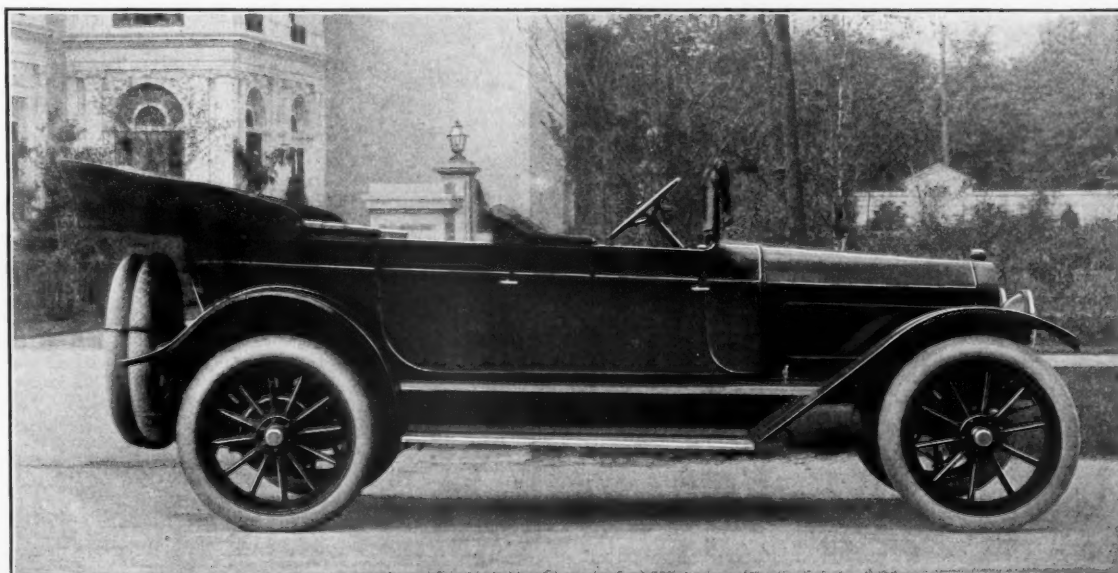
39 European Models Average Wheel-Base 112.2 Inches—Average Cylinder Capacity 2324 c. c.

Peerless 4-Cylinder Model Wheel-Base 113 Inches—Cylinder Capacity 3615 c. c.

Wheel-Base Almost Identical but 56% More Power

*(The Wheel-Base of the 6-Cylinder Model is only 8 Inches Greater than the 4-Cylinder)*

Formerly in Europe, as in America, automobiles were used mostly for touring. Today in Europe, and in America, for one day of touring, over twenty days of utility work is done by



Peerless "All-Purpose" Six

## The Latest European Specifications and "Peerless" Quality

*Peerless*

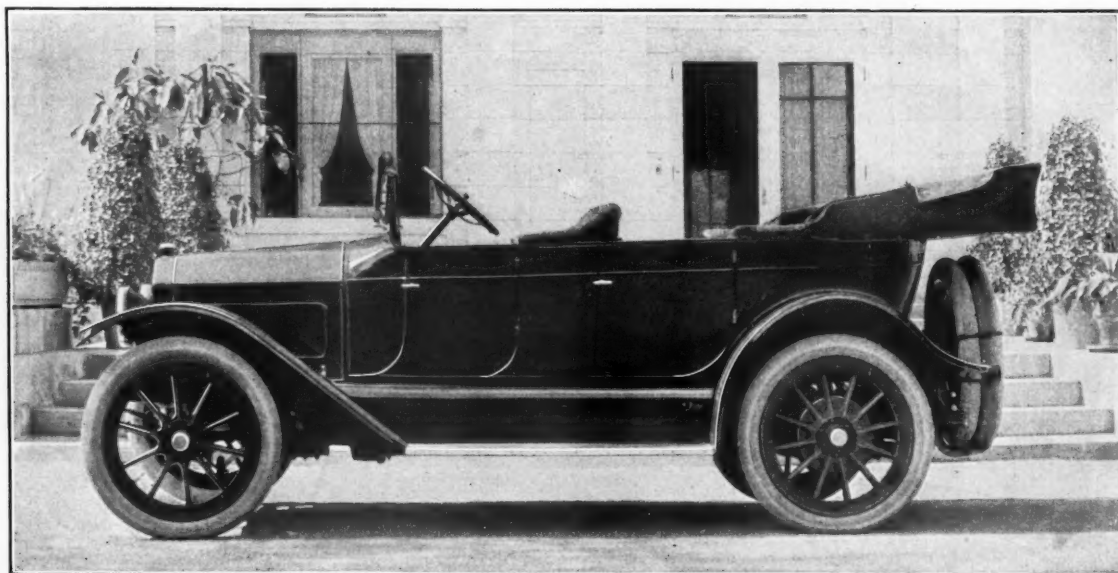
the average automobile. Europeans no longer buy heavy, long wheel-base cars. They buy a new "all-purpose" design that turns entirely around without backing in city streets and can be run for less than half of the tire and fuel expense of the old touring type—yet equally comfortable for touring.

For the Peerless Spring Suspension combined with location of rear seat produces riding ease equal to the long wheel-base cars. Yet the gain in economy, running and tire cost, and ease of control, is almost unbelievable!

Think of an automobile running over 300 miles without refilling its ordinary-size gasoline tank! Yet this is what the Europeans now demand of this type of car!

Think of a high grade, spacious, durable car that complete, ready-to-run, weighs less than 3,000 pounds! Judge what the tire saving must be!

Think of a car that is easiest riding for touring, yet can twist and turn in a city street, where to use an old-style, long wheel-base car would be impractical, if not dangerous!



Peerless "All-Purpose" Four



## 39 of the Leading European Cars!


Makers'  
Horsepower  
Rating of  
Thirty-nine Leading  
European Light Cars

ALBION	Scotland	15 H. P.
ARGYLL	Scotland	12-18 "
BAGULEY	England	15-20 "
BENZ	Germany	12-20 "
BERLIET	France	15 "
BIANCHI	Italy	12-18 "
BRASIER	France	12 "
CHARRON	France	15 "
CLEMENT	England	12-16 "
CROSSLEY	England	15 "
DARRACQ	France	12 "
DE DION	France	12 "
DE LAGE	France	14 "
DE LAHAYE	France	12-16 "
DE LAUNAY BELLEVILLE	France	17 "
ENSIGN	England	18 "
FIAT	Italy	15-20 "
F-N	Belgium	12-14 "
HISPANO SUIZA	France	15-25 "
HOTCHKISS	France	12-16 "
HUMBER	England	14 "
ISOTTA	Italy	14-18 "
ITALA	Italy	14-20 "
LANCIA	Italy	15 "
LORRAINE DIETRICH	France	12-16 "
LEON BOLLEE	France	14 "
MARTINI	Switzerland	15 "
MERCEDES	Germany	12-15 "
METALLURGIQUE	Belgium	15-20 "
MINERVA	Belgium	14 "
NAPIER	England	15 "
OPEL	Germany	8-30 "
PANHARD	France	12 "
PEUGOT	France	12 "
REHAULT	France	13-9 "
ROCHET SCHNEIDER	France	15 "
SINGER	England	14 "
SIZAIRE NAUDIN	France	10-12 "
STRAKER SQUIRE	England	15-20 "

The cylinder capacity of the Peerless "All-Purpose Four" is 56 per cent above the average of these 39 European cars. The average of the 39 European wheel-bases is 112.2 inches.

## The Situation in Europe!

In Europe an over-powered car is now avoided by experienced buyers. Europeans know it uses unnecessary fuel, creates tire expense. Such heavy cars must necessarily have a long wheel-base.

When a way was discovered of producing equal ease of riding on a shorter wheel-base, all Europe turned to the short wheel-base car. Note these specifications of 39 of the leading European makes .

For the saving in weight, tire and fuel expense—to say nothing of the greater ease and comfort in operation—is remarkable. Note how in Europe this model is now displacing all others.

### Note These Unusual Features in This New "All-Purpose" Car!

The New European Wheel-Base, enabling a complete turn (without backing) to be made in the average city street, yet with complete ease of riding.

Remarkable System of Spring Suspension on Chassis produces an ease of riding heretofore found only in the longest and heaviest cars made. (Continued on next page.)



Divided Front Seat. Plenty of Room for Every Passenger



**\$5,000 Equipment!**—such as tire pump, mohair top with cover, two-unit lighting and starting system, ammeter, dash light, speedometer, rear gasoline tank and tires, one-man top, divided front seat, full-carpeted floor, all regular Peerless quality.

**Style and Beauty Only Obtainable in Aluminum Bodies**—as used in the Peerless “48-Six” and all other makes of \$5,000 cars. The first car of its price in which this material is used.

**Spiral Bevel Rear Axle Gear**—the same as used heretofore only in the highest priced cars sold in America, identical in design with the 1915 Peerless “48-Six.”

**Divided Front Seat**—with full-carpeted floor from dash to rear seat, improving ventilation of front compartment, gives more room for driver's right arm, promotes sociability and convenience.

**Extra Large Wide-Opening Doors—Three-Abreast Rear Seat**—and many other comfort features found heretofore only in \$5,000 cars—Actually duplicating in comfort the Peerless “48-Six.”

**This Peerless “All-Purpose” Car** is designed to interest experienced buyers familiar with and desiring all the improvements and comforts of a \$5,000 car for \$2,000. It is not a \$1,400 car built to supplant a \$1,600 car.

The  
Latest  
European  
Specifications and  
Peerless Quality for  
**\$2,000**

Six-Cylinder Models  
\$250 Additional

## For Dealers

If you are a progressive dealer and are located in a town where the Peerless is not represented, write for the details of our plan of unusual co-operation on first car sales.

*Send for a Descriptive Bulletin*

# The Peerless Motor Car Company

Cleveland, Ohio

Licensed under the Kardo Patents

Makers also of the “48-Six” and Peerless Trucks



# 10,000 Miles Guarantee



Bricton Tires are backed by the strongest guarantee ever put behind a pneumatic tire

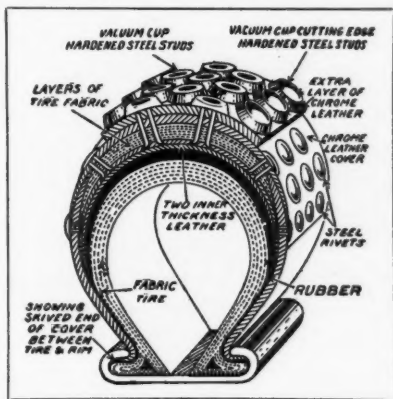
Never before have tire users been offered such assurance of continued service

## Bricton Pneumatic Tires give you real Tire Economy

Bricton Pneumatic Tires are sold under a specific 10,000-mile written service guarantee, based on the results of six years' experience. They free you from the dangers of punctures, blow-outs and rim-cuts. Proof against oil, gasoline and ruts. Their wonderful resiliency contributes greatly to your comfort when you ride.

### *Your Tires Can Readily be Rebuilt the Bricton Way*

If the fabric in the tires you are now using is in good condition, we can take them and make them proof against rim-cutting, punctures, blow-outs, side-wall breaks, skidding, ruts and oil. This will give you thousands of miles of added service.



### What One User Says

Several months before beginning my trip from Detroit, Mich., to Detroit, Fla., I thoroughly investigated tires of several well advertised kinds. I finally decided for my trip that the Bricton was the most economical and durable tire that I could find.

I am daily asked if I have many punctures. I reply that I do not know what a puncture is. I am driving on all kinds of roads under all kinds of conditions and never have a thing to worry about.

I have been on the road since the 8th day of last October, and if all goes well, will begin my Florida trip again about October 1st next.

I consider the tires worth almost their weight in gold. I would not do without them at twice the price.

W. J. BREWSTER,  
236 Jefferson Ave., Detroit, Mich.  
August 10, 1914.

### For Full Information, Including Free Trial Plan, Mail Back This Coupon

Bricton Mfg. Co.,  
12-104 Bricton Bldg., Brookings, S. D.

Please send me full particulars about Bricton Tires, explaining your free trial plan, also explain how my own tires can be rebuilt the Bricton Way.

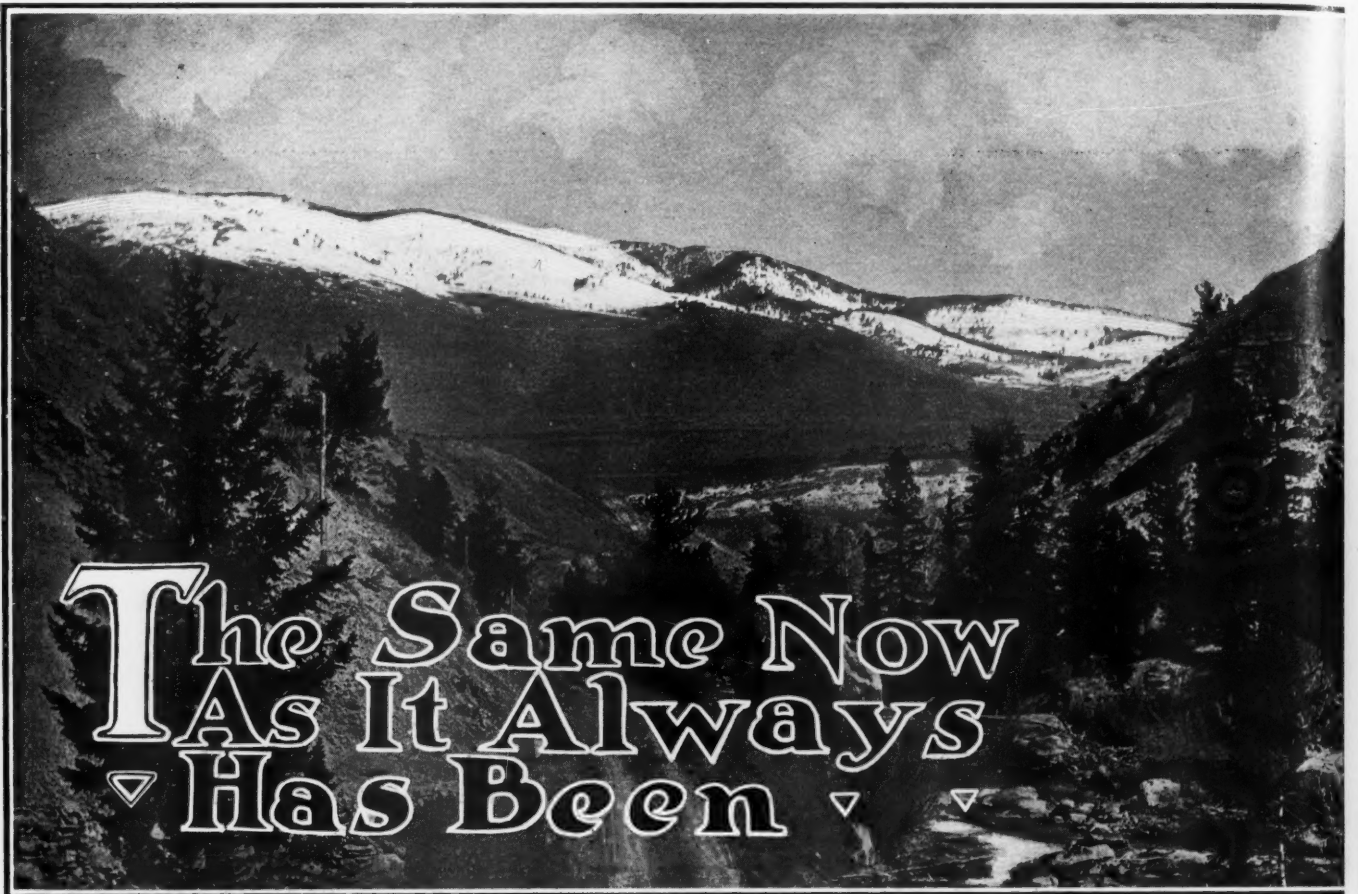
Size of Tires.....

Name .....

Address .....

Dealer's Name.....

**The Bricton Mfg. Co.** 12-104 Bricton Bldg.  
Brookings, S. Dak.



# OUR GUARANTEE

*If Raybestos fails to last one full year from the date it is placed on the car, we will furnish new lining without charge. This guarantee applies to all types and weights of pleasure cars and to all light trucks.*

THIS, in effect and practice, has been the guarantee of Raybestos ever since it was placed on the market nine years ago. It is not new; we are reiterating it so as to bring a deeper realization on the part of those whose uniform satisfaction with Raybestos has caused them to grow careless of the advantages—quality, service and economy—of specifying and insisting upon Raybestos.

The Raybestos guarantee is a better and more logical guarantee than goes with any tire or any other part of a motor car not made of steel.

TRADE MARK  
**Raybestos**  
REG. U.S. PAT. OFF.

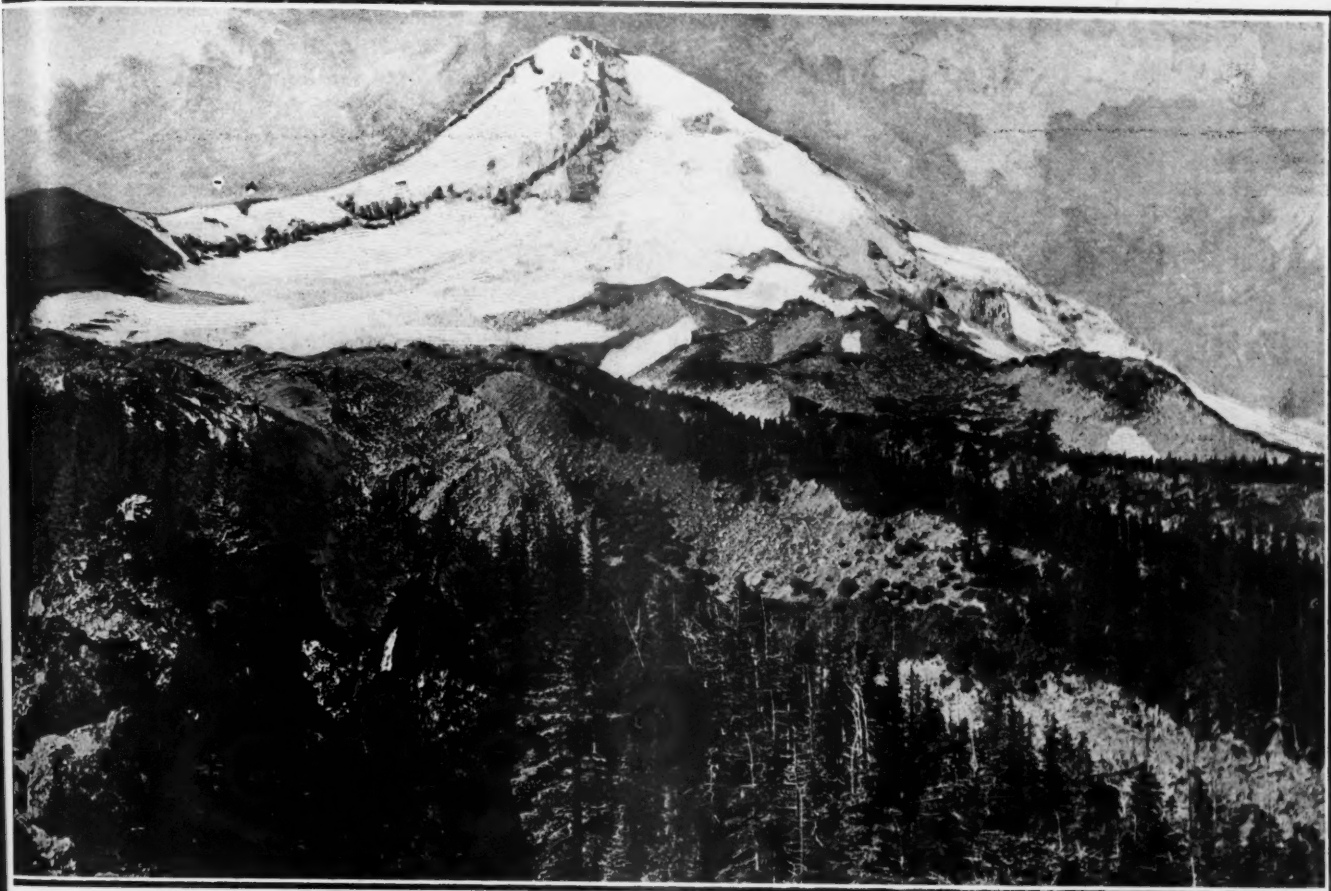
"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

Raybestos is guaranteed for one year. It is guaranteed to give perfect braking service for that length of time, whether the car is run five hundred miles or fifty thousand miles.

To be worthy of such a guarantee Raybestos must be able to maintain its braking qualities under the maximum service it is possible for it to get in the course of a year. In average use Raybestos will last for a period of years.

However we have made the statement that Raybestos is the product of brake specialists, and we





# GUARANTEE

are, in effect, selling brake service with every equipment of Raybestos that goes out of our factory, and that service invariably is far in excess of our guarantee. This we know, for seldom are we required to substantiate our guarantee.

And it is uniform service you get with Raybestos.

It is the same in actual use as engineers' tests show it to be. The manufacturer who lines his brakes with Raybestos cannot go wrong—the dealer who sells cars Raybestos lined cannot go wrong—and those who buy cars

Raybestos equipped cannot go wrong. No one

who sells or uses Raybestos gambles on either its service or efficiency—that, the resources of a responsible business organization are pledged to secure. Freely and willingly do we make good our guarantee of service.

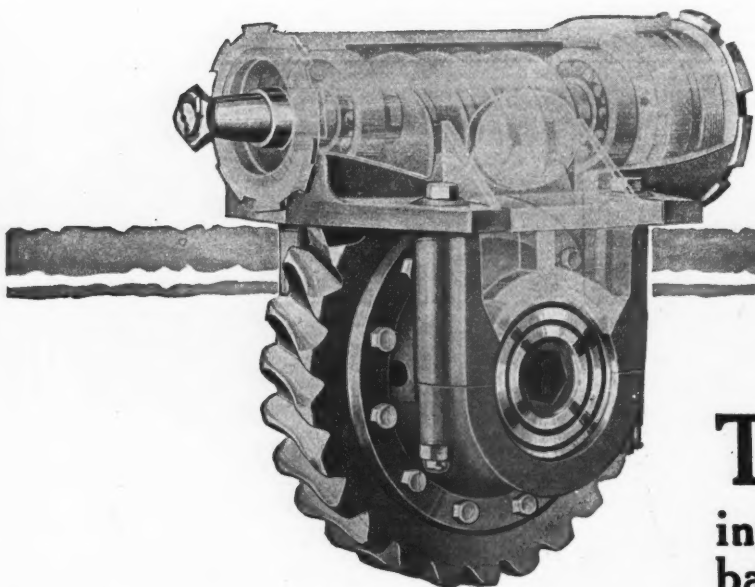
Gambling is a poor pastime anyway; and when safety is made the stake in a gamble, it shows a remarkably thoughtless attitude. Why not use Raybestos and be sure?

In order to distinguish Raybestos from other brake linings, both edges have a coating of silver

**Raybestos**  
TRADE MARK  
REG. U.S. PAT. OFF.  
"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

and every foot bears the Raybestos Trade Mark.

**THE ROYAL EQUIPMENT COMPANY**  
1354 BOSTWICK AVE., BRIDGEPORT, CONNECTICUT



**T**HE preference of Sheldon engineers for the semi-floating type of axle construction is based upon the ability of this type of axle to meet and with-

stand actual service conditions not only more consistently but with infinitely greater success than any other type of axle, whether considered in connection with pleasure car or truck practice.

A full-floating axle is an axle wherein the differential is supported wholly by housing; wheel supported on two bearings wholly by housing; driving axles take only torsional loads.

A semi-floating axle is an axle wherein the differential is supported wholly by housing; wheel supported by driving axle supported by bearing seated in housing, taking both torsional and wheel loads.

An analysis of the two general types of axle construction shows the structural points to be all in favor of the semi-floating type. There is, however, one important feature of the full-floating type of axle which is worthy of serious consideration; that is accessibility. Some people argue that accessibility is a much to be desired feature in any mechanical device, but if the endeavor to secure accessibility compromises the service efficiency of a mechanical device we must weigh carefully the relative values of service on the one side and accessibility on the other side.

# SHELDON

## MAKERS OF SPRINGS AND AXLES FOR HEAVY WILKES-BARRE

CHICAGO: 122 S. Michigan Blvd.

SAN FRANCISCO: 444 Market Street





Sheldon engineers prefer to honor the demand for accessibility by doing everything within their power to obviate the need for accessibility.

Accessibility is about the only virtue possessed by the full-floating type of axle which is not possessed by the semi-floating type in an equal degree.

Accessibility for lubrication is of course a cardinal virtue but in this respect there is no choice between the two types of axles.

Accessibility to facilitate the accomplishment of repairs would be a virtue if it were not a downright confession of weakness.

Semi-floating axle construction is the confidence of strength.

The first and greatest advantage of the semi-floating type of axle construction is strength, lightness and simplicity which this type of construction allows.

Simplicity is the mark of master design, lightness the mark of master construction. The strength of the semi-floating type of axle construction is the answer Sheldon engineers give if they have been guilty of sacrificing accessibility in preferring semi-floating axle construction to full-floating axle construction, and this is a logical reason, for it amounts to what counts for service. It is the thing which makes a Sheldon axle one of the last things on either pleasure cars or trucks to give trouble.

Sheldon front axles, Sheldon springs, Sheldon brake and radius rod equipments are all produced according to the same high plane of engineering which has developed Sheldon Worm Gear Rear Axles.

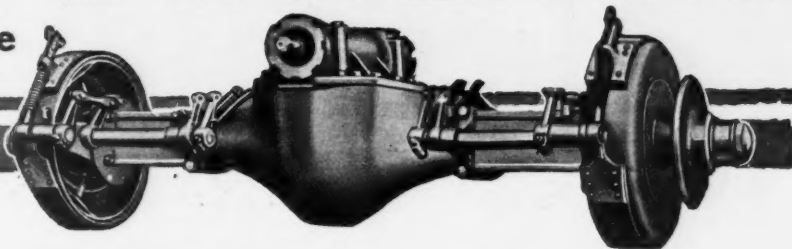
In each unit of our production, efficiency and service are the dominating characteristics sought. Each of these units shows a most intimate knowledge of truck engineering and truck service conditions.

# AXLE CO.

## DUTY SERVICE FOR MORE THAN 50 YEARS

## PENNSYLVANIA

DETROIT: 1215 Woodward Avenue



*When Writing to Advertisers, Please Mention Motor Age.*



# \$3.85

*Ready to Attach*

## Why Pay More for Horns That Won't Do More?

It is impossible, at any price, to get a more effective electric warning signal, protected by a broader guarantee than the

# REXO II

Rexo II is unconditionally guaranteed for the life of the car. It is standard equipment on many of America's most popular makes of cars—ample indication of its thorough workmanship and absolute dependability.

Dealers: The Rexo II is a horn of tremendous sales possibilities—a guaranteed horn at a remarkably low price—meeting with no serious competition—a horn that sells readily and **stays** sold. Write for co-operative sales plan.

### The Garford Manufacturing Co.

2503 Olive Street, ELYRIA, OHIO, U. S. A.

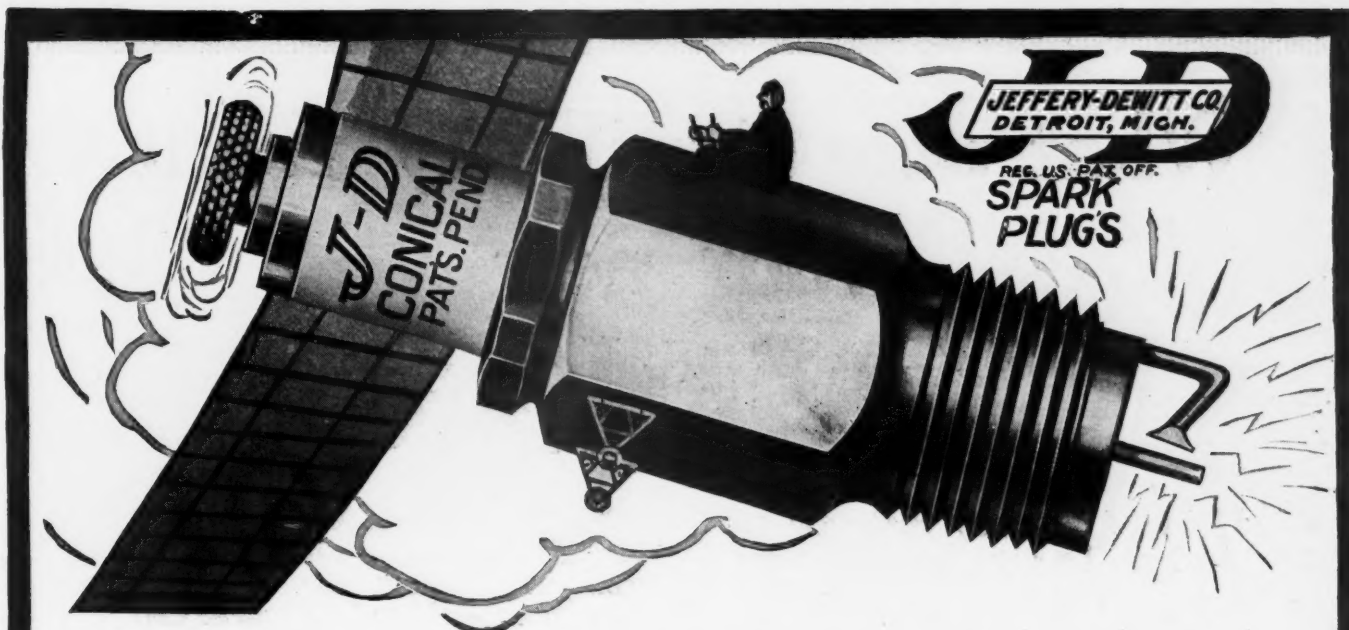
#### BRANCH

The Garford Mfg. Co.,  
Kansas City, Mo.

#### DISTRIBUTORS

The Dean Electric Co., Seattle, Wash.  
The Dean Electric Co., Los Angeles, Cal.  
Sumter Telephone Supply Co., Sumter, S. C.





## High Above All Others—This J-D Ford Special—

## Seventy-Five Cents

The **J-D** Ford Special Spark Plug is designed especially to give the best possible service on Ford Cars.

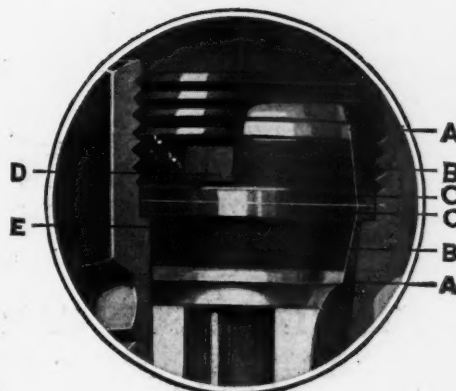
The Hex is one inch long, allowing ample room for the spark plug wrench when screwing the plug in the cylinder.

The porcelain is of the long type and conical in shape, which greatly increases its efficiency in oily and sooty engines.

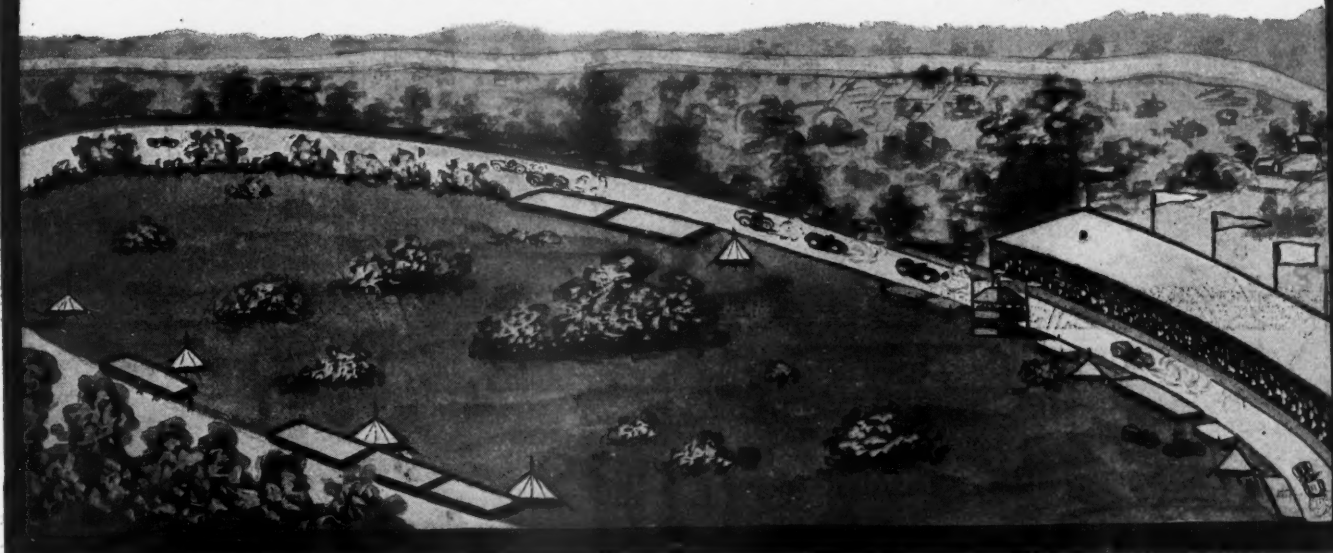
All of the metal parts are accurately machined. The bushings or packing nuts are case-hardened, which insures a long life, and prevents bruising and forcing out of shape by a wrench. The porcelain is the highest grade, manufactured at the **J-D** potteries and of a new heat-proof composition especially developed for the purpose.

A new form of all-metal packing insures a perfectly tight joint, which greatly increases the effective strength of the porcelain. No asbestos or other shrinkable material is used—nothing but the ring (B) (B) shown at the right, of special alloy which expands and contracts in exact ratio with the porcelain itself. The flanged edges (C) (C) make a collar that supports the porcelain (A) (A) in the shell, and also takes all strain of tightening the bushing.

Special literature and quotation sheet, as well as a direct-to-dealer proposition for increased profits, mailed on request.



**JEFFERY-DEWITT CO., 51 Butler Avenue, Detroit, Michigan**



# What people will say about your new KISSELKAR

**T**HEY will say that you selected a very handsome car, a beautifully finished, smooth running and completely equipped car—a car that has a marked individuality and distinction that “stands out from the crowd.”

If privileged to ride in it, they will enthuse over its characteristics of comfort, convenience, refinement and roadability.

Given a view of the engine they will agree that for simplicity and improved construction, it is unequalled.

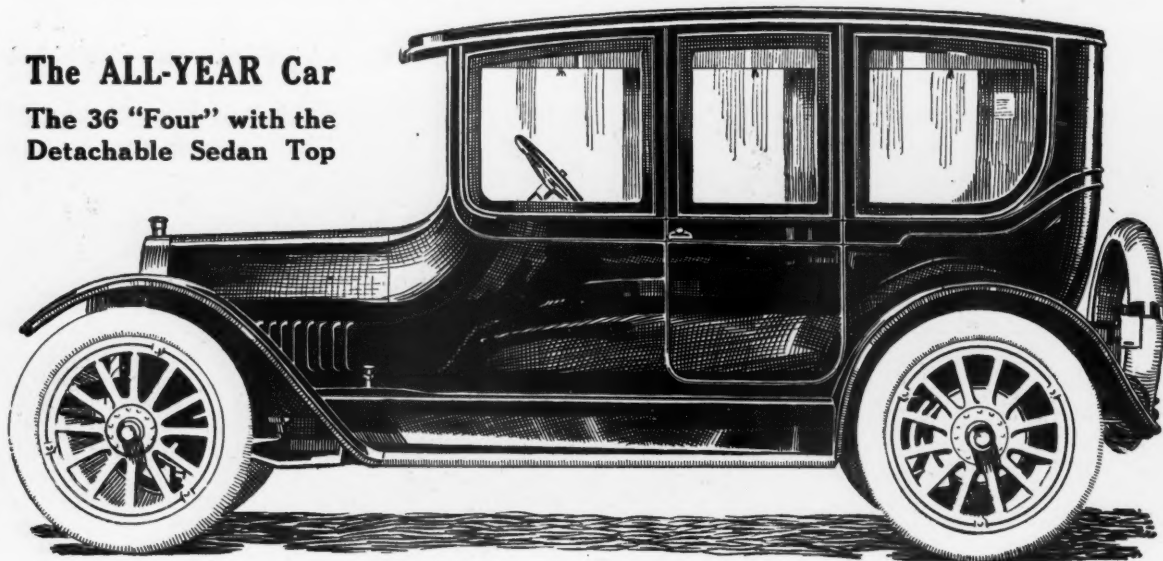
The most eloquent and convincing argument for a KisselKar is the car itself. Write for literature.

**KISSEL MOTOR CAR CO., 121 Kissel Ave., Hartford, Wis.**

Boston, New York, Chicago, Milwaukee, Kansas City, Minneapolis, St. Paul, Dallas, San Francisco, Los Angeles, Oakland, Philadelphia, Detroit, St. Louis, Seattle, Cleveland, Houston, El Paso, New Orleans, Baltimore, Nashville, Duluth, Pittsburgh, Hartford, Conn.; New Haven, Albany, Troy, Rochester, Providence, Marshalltown, Ia.; Omaha, Hastings, Neb.; Madison, Montreal, Quebec, Toronto, Winnipeg, Calgary and 300 other principal points throughout America.

## The ALL-YEAR Car

The 36 “Four” with the Detachable Sedan Top



The 36-“Four” is \$1450, the 48-“Six” is \$2350, the 60-“Six” is \$3150—incomparable values each. Body design optional—either four door or two door touring, or the roadster type.

## The ALL-YEAR KisselKar

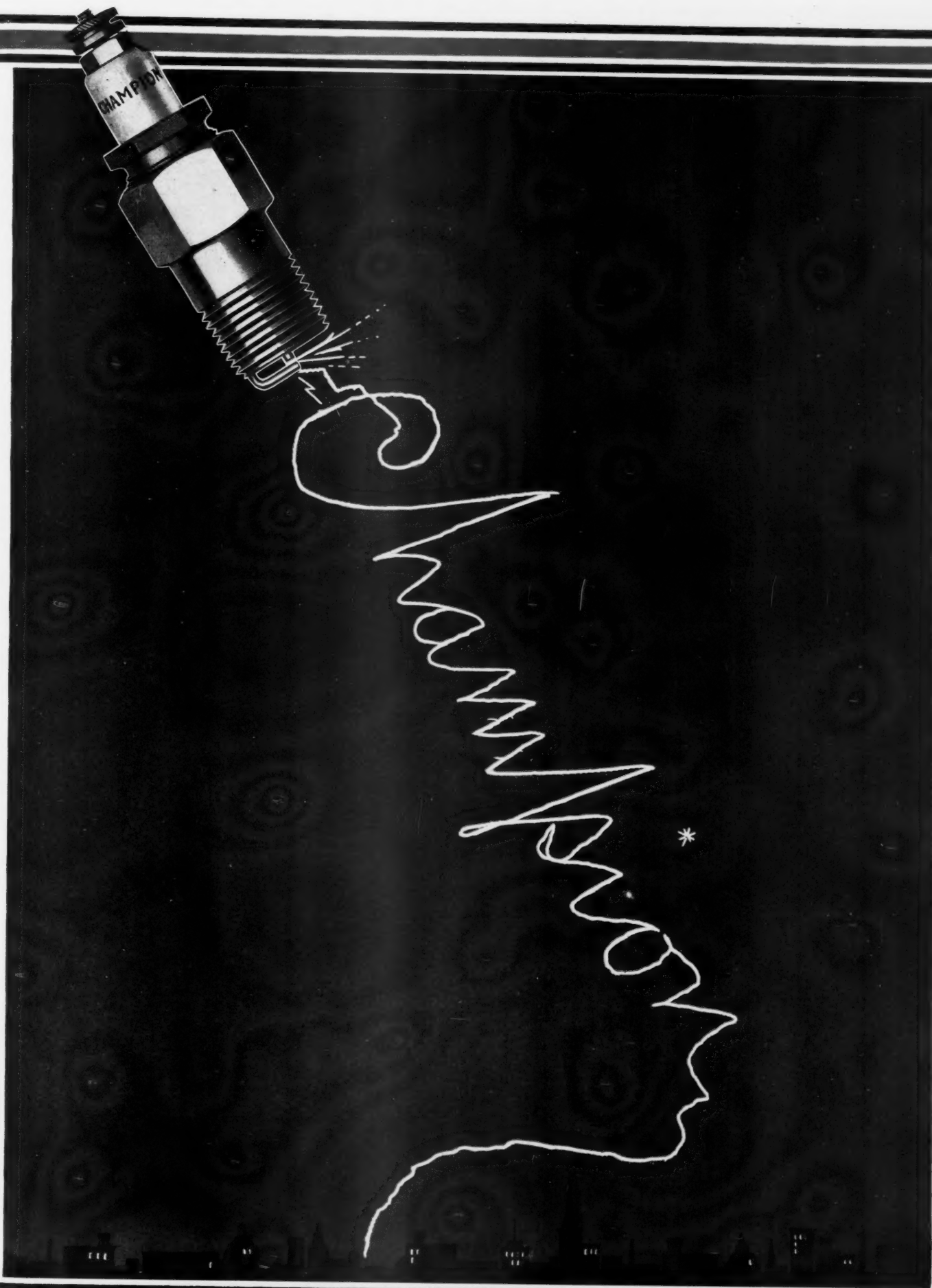
For \$350 extra the 36-“Four” or the 48-“Six” may be equipped with the original KisselKar Detachable Sedan Top for winter driving.

You can have your car delivered now with the top attached and easily remove it in the spring without expert assistance.



Detachable Sedan Top





· "TOLEDO MADE FOR THE WHOLE WORLD'S TRADE"



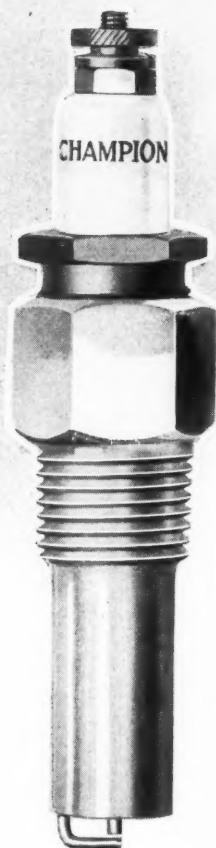
Metz won the Glidden trophy, climbed hills in record time and is constantly capturing races in the very fastest company. It is a remarkable car.

It is equipped, like other high efficiency machines, with CHAMPION SPARK PLUGS.

Few people realize what extreme caution automobile builders exercise in the selection of such an essential as the spark plug.

One faulty plug means a motorist's dissatisfaction.

That's why the famous Metz car, built to be light, speedy, durable and dependable, is factory equipped with the most efficient and satisfactory spark plug made—the CHAMPION.



The principle of the spark plug is simple.

But the selection of materials and the accuracy of manufacture are intricate and technical. It took years of experience and the manufacture of millions of plugs before we learned the one best way of putting electrodes indestructibly into the porcelains, the absolute necessity of expensive manganese nickel sparking points, and of making the shells extremely uniform and concentric in order that expansion due to heat might not break the core.

Every part is machined and gauged with extreme care and the assembly is so thoroughly inspected that flaws cannot creep in.

Compression leakage, that fault so common in most other brands of plugs, is completely eliminated by the patented gasket construction, of the CHAMPION SPARK PLUG. These patent asbestos lined copper gaskets form an absolutely compression tight cushion between the porcelain insulator and the metal parts of the plug. They completely seal up the space between the parts, besides taking care of all undue expansion, which is cause of insulator breakage. Our guarantee is based to a great extent on this construction.



THE GLIDDEN WINNER



# SPARK PLUGS DAILY

FORD, STUDEBAKER, MAXWELL, METZ AND FORTYNINE OTHER MAKES OF MOTOR CARS ARE EQUIPPED EXCLUSIVELY WITH CHAMPION SPARK PLUGS.

The firms enumerated above represent an investment of approximately \$150,000,000. The reputation of the products of these concerns would be seriously jeopardized by imperfect spark plugs. When they, year after year, equip their cars exclusively with Champion plugs it furnishes the highest possible demonstration of CHAMPION excellence.

We advise you to follow the judgment of the greatest automobile engineers and those everywhere who are in the best position to know the relative merits of spark plugs.

## THEY SELECT CHAMPIONS

There is a CHAMPION PLUG made for every gasoline engine. If you could call on every man who sells CHAMPION PLUGS, you would find them in 30,000 establishments throughout the United States. Go to your dealer and he will advise you as to exactly which plug will best meet your requirements, a "CHAMPION," made particularly for your car.





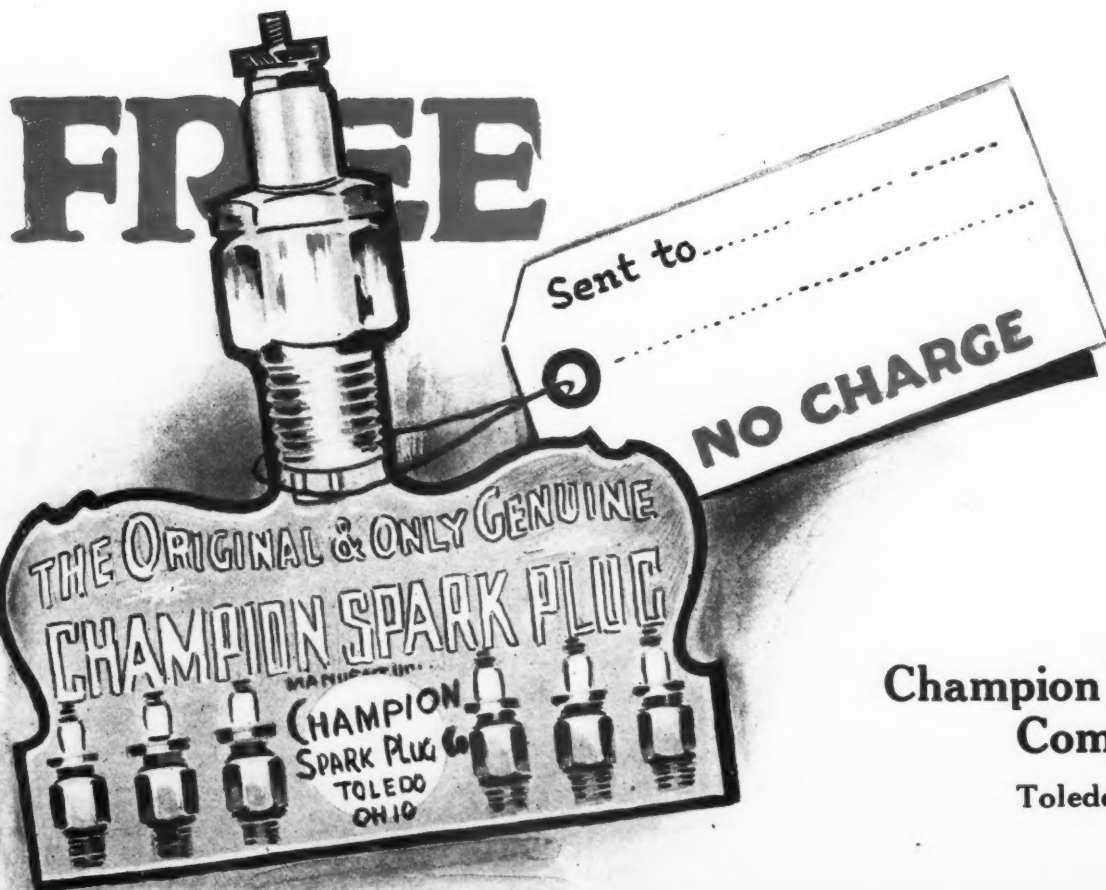
# 30,000 DEALERS

There is only one possible method of placing an accessory on sale in 30,000 dealers' stores. And that is to make an article which gives absolute satisfaction, which has the largest possible demand, and which nets the dealer a material profit.

CHAMPION SPARK PLUGS fill these requirements.

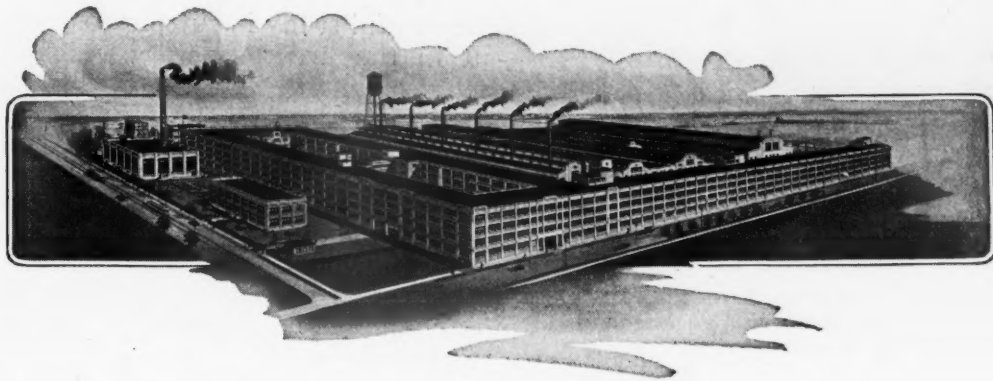
The Champion Spark Plug Company is at this moment making 25,000 spark plugs every working day. This means over 7,500,000 plugs this year, or that more than half of all the spark plugs used throughout the United States are CHAMPIONS. If you are selling spark plugs, but not Champions, you can readily see that you can more than double your sales by merely adding the CHAMPION line.

This attractive display card, with CHAMPION plugs attached, we will send free to any dealer ordering through his jobber, 100 CHAMPION plugs in a shipment. You should take advantage of this special offer at once.



**Champion Spark Plug Company**  
Toledo, Ohio





# DODGE BROTHERS

## DETROIT



Number of dealers applying for selling  
rights reached 11,288 October 12th



FOR seven years the famous Zenith has remained unchanged in principle. Founded on the Compound Nozzle of uniform mixture under all conditions it is today a known factor in the automobile industry of the world. This has been fittingly recognized by a first prize award from the German War Office. Read the Zenith story.

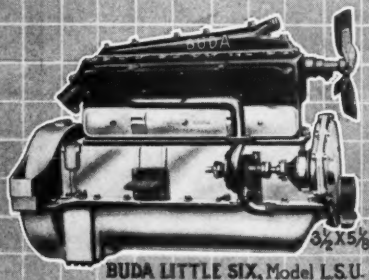
## Balanced Efficiency Studies Trifles

EFFICIENCY overlooks nothing. Saving money here and wasting there gives but a common average. The careful study in cutting costs worked out in the Zenith factory reaches into each department.

Above is pictured a shipping box for local delivery. Just so many carburetors go into this box and no more. The count must be right. Each Zenith fits in its place and is held securely by rubber strips on the cover. No waste handling here—no chance of error. Quick and easy—the ideal condition. The Zenith overhead is low.



**ZENITH CARBURETOR CO. DETROIT, MICH.**



"Just a line to  
tell you" why the latest

**BUDA**  
MOTOR

is "The Part That Sells The Car"

### PROOF NOT ASSERTION

The black line is the remarkable "horsepower curve" one of the latest Budas, model LSU. It may not look so wonderful to the untechnical reader as it does to an engineer. But compare it with the gray line which runs below it. The Buda line shows a steady increase of horsepower with increase of speed, clear up to 2000 revolutions per minute, which means EXTRAORDINARY efficiency and economy, while the gray curve which represents the comparative efficiency of the usual motor begins to fall off much sooner. There's a big story in this line. It tells of the perfection of the Buda manufacturing process which stands unexcelled in its field from start to finish. It means positive saving in gasoline, repairs and nerves. The latest Buda design speaks for itself as to beauty, accessibility and compactness. Look at it. Then write us for particulars.

**THE BUDA COMPANY, HARVEY, ILLINOIS, (Chicago Suburb)**

Address: BRANDENBURG & Co. Part'y Reps., 1102 So. Mich. Av., Chgo.; 57th & B'way, N. Y. C.; Ford Bldg., Detroit.

REVOLUTIONS PER MINUTE  
1000 1500 2000

HORSEPOWER

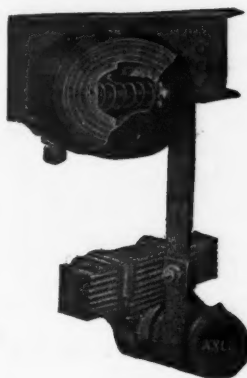
ORDINARY HORSE POWER CURVE

BUDA HORSEPOWER CURVE BY SPRAGUE DYNAMOMETER



# GABRIEL SNUBBERS

## Standard Equipment:



CHALMERS  
WHITE

STEARNS-KNIGHT  
PEERLESS

OLDSMOBILE  
LOZIER

Partial or special equipment on more than 20 other leaders



*Ask the Engineers of YOUR car, or any Snubber user you meet. Let us send literature and name of nearest distributor.*

**Gabriel Horn Mfg. Co., 1415 E. 40th St., Cleveland, Ohio**

## BALL BEARING FACTS

Automobile manufacturers who have been using foreign makes of ball bearings need not worry over the war.



WORKS OF THE NEW DEPARTURE MANUFACTURING COMPANY  
2,000 Men, Skilled in Manufacturing Ball Bearings, Are at Your Command.

The New Departure plant is producing between ten and twelve thousand bearings per day and this is not its maximum capacity. We can guarantee your specified deliveries not only now, but for any length of time in the future. We can also guarantee the quality of New Departure bearings to be the equal of any.

We solicit an opportunity to demonstrate to you our ability to completely meet your requirements *now*.

**The New Departure Manufacturing Company, Bristol, Conn.**  
WESTERN BRANCH, 1016-17 FORD BUILDING, DETROIT, MICHIGAN



## THE SPIRAL

*You Must* meet the keen competition of "the other fellow."

*You Must* build dependability and success into your car.

*You Must* give your dealer the same advantage your competitor does by building into your car products upon which he can solidly base his sales talk.

## WARNER SPIRAL Bevel Differentials

Will solve one of your problems.

They insure quietness, smooth application of power and absolute satisfaction.

Built by the efficient Warner organization with a known country-wide reputation as the "best," they mean one of the most valuable selling arguments in your car.

**Highest Quality Transmissions,  
Steering Gears, Differentials**

# WARNER GEAR COMPANY, MUNCIE, INDIANA

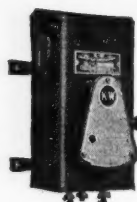
DETROIT OFFICE, 910 FORD BUILDING

HIGH and  
LOW TENSION  
MAGNETOS



MASTER VIBRATORS  
ROAD SMOOTHERS  
AUTO LOCKS

## Ten Reasons Why the MASTER VIBRATOR



is the Standard of Excellence all over the world.

### ITS Use Means

Perfect ignition—more power—a hotter spark—easier starting—one adjustment instead of four—a smoother running engine—less gasoline used—cleaner spark plugs—less carbon deposits—no worry service.

### Beware of Imitations

Genuine K-W Master Vibrators all carry the K-W trademark and a serial guarantee number. They are sold by dealers who know the difference, everywhere.

\$15 with regular kick switch  
\$16 with Yale Auto Lock switch

IF YOUR DEALER CANNOT SUPPLY YOU, SENT DIRECT POSTPAID ON RECEIPT OF PRICE. WRITE FOR BOOKLET.

HEADLIGHTING  
OUTFITS

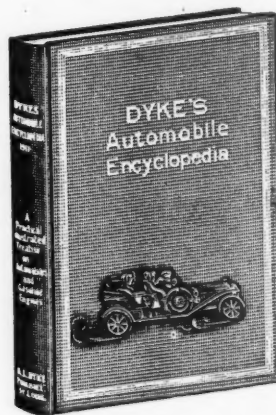


SPARK COILS  
SPARK PLUGS

## Dyke's

## 1914 Automobile Encyclopedia

by A. L. Dyke, E.E.



¶ Just the book you've longed for. Not technical but simple, practical and clear. Teaches the principle—begins at the foundation and gradually works up to more detailed explanations.

¶ Over 1000 illustrations; 268 charts; 596 pages.

¶ Almost anything you want to know or any trouble you want to remedy—simply turn to the index—tells you how to diagnose and correct any trouble.

¶ Teaches you the principle of all engines, valves, carburetors, ignition, self-

starters—in fact everything you want to know.

¶ Teaches you to overhaul a car from the ground up.

NOTE—The new 1914 Book contains a new supplement on the principle, construction, operation and care of leading ELECTRIC STARTING, GENERATING AND LIGHTING SYSTEMS. Delco and other systems are simplified so a child can understand. Cadillac magnetic latch, two speed rear axle, etc., explained. PRICE, \$3.00, postage prepaid.

### Address

Book Department **CLASS JOURNAL CO.**  
910 So. Michigan Avenue Chicago, Ill.

(20)



"What do you do when acid leaks over the top of your battery?"

"Get a GOULD BATTERY and there won't be any leak"



Outside cleanliness and provision for easy maintenance are just as essential as abundant current delivery in a starting battery, yet the new Gould type shown below is the only one made with a **sealed leak-proof** top that permits filling without a syringe or funnel.

The simple twist of a cap exposes the acid level to plain view and permits real test. With cap replaced the acid **must** stay in and the dirt out.

The design throughout evidences Gould engineering judgment. Ask for prices.

## Gould Storage Battery Co.

General Offices: 30 E. 42d St.  
New York City

Works:  
Depew, New York

Boston—14-16 Cambria St.  
Philadelphia—613 Betz Bldg.  
Cleveland—1761-5 E. 18th St.

Chicago—225 E. 22nd St.  
San Francisco—1448 Van Ness Ave.  
Los Angeles—110 E. Pico St.

### Agents in

Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Minneapolis, St. Louis, Kansas City, Omaha, Denver, Topeka, Seattle

### CANADIAN REPRESENTATIVE:

R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver  
Full stock of parts, plates and repairs carried by all offices and agents.

130



**\$250.00 A MONTH**  
**MAKE** **Repairing** **AUTO MOBILE Tires**

Sounds like a lot of money  
—IT IS—A WHOLE LOT of MONEY to be earning CLEAR every month—yet it's what hundreds of men we have established in the Automobile Tire Repair Business are making. You let down the DRAW BRIDGE for SUCCESS to enter into your career by getting into business for yourself. The business for you is the one where investment is small—the returns quick and for cash—where the margin of profit is large—the demand for your PRODUCT or SERVICE constant and ever on the increase.

## A HAYWOOD TIRE REPAIR EQUIPMENT

answers to all of these requirements of Old Dame Fortune—The certainty of success in this business is as sure as anything in this world can be—Each year adds thousands of new Automobile Owners—they need YOU to keep their tires in service.

## Here Is Your Opportunity!

Be first to enter this new, big paying business in your town. Open your pockets. Let the dollars pour in. Act quick. Every auto sold means more tires to mend. Automobile business is growing fast—enormous field for tire repairing. Punctures and blowouts are common. Tires need retreading and vulcanizing. Something going wrong all the time. Thousands forced to buy new tires because they can't get old ones fixed. Think of the old bicycle days—repair shops on every corner—all making money—busy day and night. Autos make same proposition over again—only ten times bigger and better. Users of Haywood Tire Repair Plants are making big money. Johnson, Tex., writes: "I have made as high as \$18 in a day." Another man who bought a plant September, 1911, writes he has cleared over \$3000.00. That's going some! Operate a plant as side line in connection with auto business—garage or as an independent business. Find neighborhood where there's a bunch of autos—get all the steady business besides transient work. Experience unnecessary. You learn quick. Simply follow directions—practice a few days on a couple of old tires and you'll be ready to coin money. Business comes fast and easy.

### Repair Tires At Home

Young men! and boys repair father's tires—get money he pays garage man. Get the neighbor's work. Make money to attend college or to start a garage and repair business.

Auto Owners—Repair your own tires—save money—pay for your outfit in short time. We have outfits for home use. Anyhow, investigate. Send today for catalogue. See the wonderful possibilities in this marvelous field. Learn of the enormous money-making opportunities in this fascinating new business.

The New Money-Making Business—Start Now—This Man Is Making Money.

Business Keeps Coming



Haywood Tire & Equipment Co.  
720 N. Capital Ave., Indianapolis, Ind.



WISE motorists take Basline Autowline along. Then they're sure of getting home again. This little giant towline hooks securely to a car in half a minute. Can be attached, too, without marring a highly finished car in the least.

## Basline Autowline

"The Little Steel Rope With the Big Pull"

is a neat, compact coil of flexible 1/4-inch steel wire rope, about 25 feet long, same high quality wire as Yellow Strand Powersteel, the world's best wire rope. Takes no room—is never in the way. Most motorists carry this little road necessity under a front seat cushion where it's handy. But no matter where or how it's carried—you can't motor in safety without a Basline Autowline! All accessory dealers carry this little towline. Price, east of Rocky Mountains, \$3.95. Get one and be prepared to tow or be towed.

**FREE** Write for free illustrated Autowline circular

**Broderick & Bascom Rope Company**  
813 N. Second Street, St. Louis, Mo.

New York Office, 76 E. Warren Street

Manufacturers of famous Yellow Strand Powersteel Wire Rope that helped build the Panama Canal.



## TROY Trailers

## Make the Motor Truck Pay Big

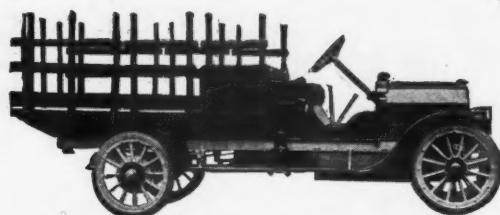
On short hauls, Troy Trailers eliminate the time lost in loading and unloading.

On long hauls, you deliver at least twice as much material per trip—often much more.

TROYS are reversible, track absolutely, can be backed around any corner, can't hurt the motor.

Bulletin MAT gives the full details. Write for it.

THE  
**TROY WAGON WORKS CO.**  
GURNSEY ST., TROY, MIAMI CO., OHIO



Model B-3, 1-Ton Truck, Complete with Express or Stake Body, \$1,500—Chassis only, \$1,400.

## A Success From the Start

This is the fourth year of Menominee success. From the start the Menominee truck proved its construction to be *right*. Sales have doubled and trebled.

## "The MENOMINEE" TRUCKS

FOR ECONOMY

Every Menominee owner is a satisfied owner. Menominee dealers have been uniformly successful—have re-contracted year after year. The truck is right, the price is right, and the organization is right. You get in the Menominee a truck that has *proved* its dependability throughout four years of gruelling service.

The 1915 line of Menominee trucks comprises a 1500-lb. truck at \$1125, a 1-ton truck at \$1400, and a 1 1/2-ton truck at \$1800. Write for catalog.

DEALERS WANTED EVERYWHERE

**D. F. POYER COMPANY**  
MENOMINEE, MICHIGAN

Statement for Oct. 1, 1914, of the Ownership and Management of MOTOR AGE, published weekly at Chicago, Ill., required by the Act of August 24, 1912.

Editor, C. G. Sinsabaugh, 910 S. Michigan Ave., Chicago. Managing Editor, David Beecroft, 289 W. 39th St., New York. Business Manager, E. E. Haight, 910 S. Michigan Ave., Chicago. Publisher, The Class Journal Company, 910 S. Michigan Ave., Chicago.

**OWNERS:** Class Journal Co., 231 W. 39th St., New York; United Publishers Corp., 231 W. 39th St., New York.

**STOCKHOLDERS**—Class Journal Company: United Publishers Corporation, 231 West 39th St., New York.

**STOCKHOLDERS**—United Publishers Corporation: H. M. Swetland, 231 West 39th St., New York; C. T. Root, 231 West 39th St., New York; C. G. Phillips, 231 West 39th St., New York; W. H. Taylor, 231 West 39th St., New York; A. C. Pearson, 231 West 39th St., New York; M. Holtz, 231 West 39th St., New York; J. M. Phillips, Upper Montclair, N. J.; W. H. Lindsay, 231 West 39th St., New York; Estate of I. A. Mekeel, Montclair, N. J.; Fritz Frank, 231 West 39th St., New York; M. C. Robbins, 231 West 39th St., New York; W. I. Ralph, 231 West 39th St., New York; Geo. H. Griffiths, 231 West 39th St., New York; Conde Nast, 443 Fourth Ave., New York.

Known bondholders, mortgagees, and other security holders, holding 1 per cent or more of total amount of bonds, mortgages, or other securities:

**BONDHOLDERS**—Class Journal Company: G. A. Wahlgreen, Denver, Colorado; W. I. Ralph, 231 West 39th St., New York; E. P. Harris, Montclair, N. J.; N. H. Van Sicken, St. Charles, Illinois; George E. Hunter, Elgin, Illinois.

**BONDHOLDERS**—United Publishers Corporation: H. M. Swetland, 231 West 39th St., New York; C. T. Root, 231 West 39th St., New York; C. G. Phillips, 231 West 39th St., New York; W. H. Taylor, 231 West 39th St., New York; W. I. Ralph, 231 West 39th St., New York; E. T. Root, 231 West 39th St., New York; S. Norvell, St. Louis, Mo.; W. H. Lindsay, 231 West 39th St., New York; Estate of I. A. Mekeel, Montclair, N. J.; E. P. Whitmore, Evanston, Illinois; E. S. Root, 309 West 92nd St., New York; J. M. Phillips, Upper Montclair, N. J.

E. E. HAIGHT, Business Manager.

Sworn to and subscribed before me this first day of October, 1914.  
[SEAL] EDNA F. McNULTY, Notary Public.  
(My commission expires September, 1915.)



# MERCER

## Has Concentrated on High Grade Fours

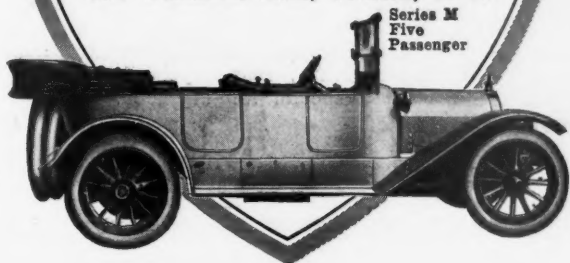
While other makers have "straddled the fence" between fours and sixes, and have endeavored to meet the demand for both quantity and quality cars, the Mercer Automobile Co. has specialized on the development of a high-grade four cylinder car—the "golden mean" between the overweighted tire-destroying heavy car, and the small, light and unendurable type with which the American market is already too full.

Catalogue sent on request

## Mercer Automobile Co.

800 Whitehead Road, Trenton, N. J.

Series M  
Five  
Passenger



## GUARANTEED ONE YEAR



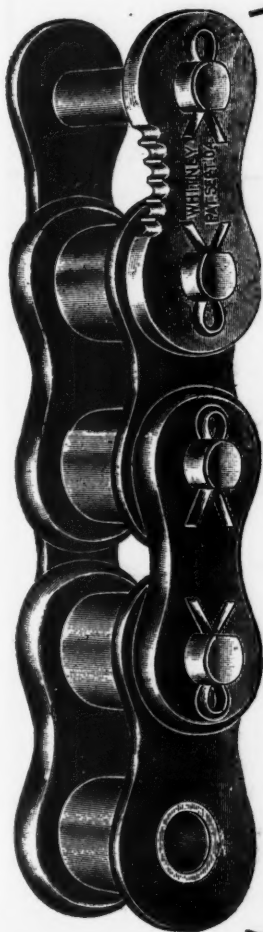
The reasons for HERZ PLUG'S superiority to ordinary makes are definite and obvious.

The insulation is DOUBLE STONE. The electrodes are PLATINUM-ALLOY. There are FOUR SPARKING POINTS. HERZ PLUG is SELF-CLEANING. It is GUARANTEED A FULL YEAR.

Price, \$1.50.

Order from your dealer or

HERZ & CO., 245 W. 55th St. (nr. B'way), New York



## "Whitney" Chains Are Used by the Leaders

They have been the recognized leaders for years and are the most practical chains built for commercial vehicles.

We have completed a large addition to our factory, making it the most modern and complete factory of its kind in the country, and are now in position to fill orders promptly.

Insist on "Whitney" Chains when making replacements.

"Whitney" Chains  
Are Built for Strains

The Whitney Mfg. Co.  
Hartford, Conn.

There's no leak proof ring but the LEAK-PROOF Ring — insist

## If You Object to Waste

—to paying full prices for short measures in fuel performance or motor wear—you will equip your engine with



MADE BY McQUAY-NORRIS MFG. CO.

They stop all power waste—preserve lubricating oil from deterioration—reduce carbonization—won't wear the cylinder.

Send for Free Booklet

It will tell you all about piston rings and what they mean to motor efficiency.

"Ask the User"

In use on over  
200,000 automobiles  
and motor boats



Sold by all up-to-date  
dealers, garages, repair  
shops and marine stores

Manufactured by

McQuay-Norris Mfg. Co., Dep't M, St. Louis, Mo.

Branch Offices:

New York—1919-29 Broadway, at 64th St. Pittsburgh—7620 Tioga St. Kansas City—513 New Nelson Bldg. Chicago—Suite 718 Michigan Blvd. Bldg. Michigan Ave. & Washington St. San Francisco—164 Hansford Bldg. Los Angeles—224 Central Bldg. Canada—W. H. Banfield & Sons, No. 120 Adelaide Street West, Toronto.

Look for the name LEAK-PROOF stamped on the Ring

TRADE MARK REGISTERED  
**NON-FLUID OIL**  
UNITED STATES PATENT OFFICE

**The Perfect WINTER Lubricant**  
NOT Affected by Temperature Changes, Winter or Summer

It ALWAYS provides a permanent, slippery, pressure-resisting cushion between gears and bearings, thereby reducing friction to a minimum and insuring you perfect lubrication in COLDEST weather. Lasts 3 to 4 times longer than fluid oils or greases—hence, most economical.

"K. No. 00 Special" grade for sliding gear transmission  
"K. No. 000" for differential, compression cups and all bearings

*Sold everywhere. Look for the orange-colored can bearing sprocket-wheel trade-mark shown above.*

**New York & New Jersey Lubricant Company**

165 Broadway, New York

1430 Michigan Ave., Chicago



## THE POWERFUL, SILENT SPHINX

**\$695**

### A REAL AUTOMOBILE

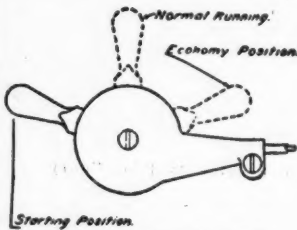
The lightest, strongest, most serviceable and economical machine of its kind ever built.

112 inch wheel base. Electrically started and lighted.

**Sphinx Motor Car Company, York, Pa.**

## MASTER Carbureters

COPYRIGHTED



Address Dept. J for Full  
Descriptive Booklet

With the MASTER CONTROL it is never necessary to run with a poor mixture.

Since atmospheric conditions cannot be controlled, a proper mixture can be maintained at the will of the driver to suit the varying atmospheric conditions.

**MASTER CARBURETOR CORPORATION**

Woodward and Hancock

Detroit, Michigan

Pacific Coast States: Master Carburetor Co., Inc., Los Angeles

## WINTON SIX

### A Rare Beauty

The 1915 Model 21 Winton Six is equipped with everything worth while, including electric starter, if you want it. And, best of all, a car of rare and exceptional beauty—the kind of beauty that impels people in the street to turn for a second longing look. Send for 64-page catalog.

**THE WINTON MOTOR CAR COMPANY**

424 Berea Road, Cleveland, Ohio

*World's First Maker of Sixes Exclusively*

Only One Tire

## THE DAYTON AIRLESS

is at all suitable for use on motor cars.

### In War Times

When the car must be ready at all times—ready to go over any surface without failure—at unlimited speeds without injury to the car—without puncture or blowout—and ready to keep on going—then use Dayton Airless Tires. War time has no place for the stock excuse that the tire was not properly inflated or there was a stone bruise or that there was some unusual service.

### In Times of Peace

Tire service conditions are the same. If you require sure service—if your car must always be ready for action—if you want sure service with economy use Dayton Airless Tires.

Write for information.

**THE DAYTON RUBBER MANUFACTURING COMPANY**

Dayton, Ohio

We will send you the address of our nearest branch or dealer.

## CONNECTICUT

### Master Vibrator For FORDS

Simple to install—Practically no adjustment—Gives more power, flexibility and makes starting easier. Price \$9.00.

**CONNECTICUT Telephone and Electric COMPANY**  
Meriden, Conn.

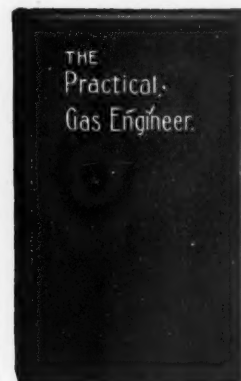
## Searchlight Gas

the most economical and dependable lighting system on the market.

Full details mailed to you on request.

**THE SEARCHLIGHT CO.**

GENERAL OFFICE, 1016 KARPEN BUILDING  
CHICAGO, ILL.



### Practical Gas Engineer

By  
**E. W. LONGNECKER**

Twelve years' constant experience with Hydro-Carbon Engines. How to start, how to operate, and how to care for all classes of explosive motors or engines using gas, gasoline or similar fuels. A full and exhaustive chapter on electric and other systems of igniting. Every line tells something. Every page full of interest. A book of 172 pages, neatly bound in cloth. Sent postpaid on receipt of price, \$1.00.

910 S. Michigan Ave., Chicago  
**THE CLASS JOURNAL CO.**

(40)





## High Tension Magnetos

for *Fords*—pleasure and commercial—are revolutionizing the running of thousands of these remarkable machines. If you want real *Ford* efficiency, write for our free booklet, "Ford Power Possibilities."

### SPLITDORF ELECTRICAL COMPANY

ATLANTA	10-12 E. Harris St.	LOS ANGELES	1215 S. Hope St.
BOSTON	St. Germain & Mass. Ave.	MINNEAPOLIS	34 S. 8th St.
CHICAGO	64-72 E. 14th St.	NEWARK	290 Halsey St.
CINCINNATI	811 Race St.	NEW YORK	18-20 W. 63d St.
DALLAS	402 S. Ervay St.	PHILADELPHIA	210-12 N. 13th St.
DAYTON	427 E. 3d St.	SAN FRANCISCO	1028 Geary St.
DETROIT	972 Woodward Ave.	SEATTLE	1632 Broadway
KANSAS CITY	1827 Grand Ave.	TORONTO	489 Yonge St.
LONDON		BUENOS AIRES	



Sedan  
De Luxe  
for  
T Model  
Ford Cars

## Convert Your Ford into a year 'round car

Be prepared for the cold, rainy or wintry days ahead by making your Ford a ROBBINSFord. This design is by far the most handsomely appointed closed car in the special body field. It seats five passengers without crowding; has luxuriously upholstered seats; electric dome lights; floors richly carpeted and is in every respect a worthy member of the popular

**ROBBINS Ford  
LINE**

### of Standardized Bodies for Ford Cars

You can now take your Ford to a Local Dealer—and in a few hours' time he will return it—completely transformed into a ROBBINSFord. Tell us what style body you prefer—a Coupe, Sedan or Commercial body—and we'll send the name of nearest dealer. Write TODAY giving the name of the man or firm you usually do business with and we'll send you descriptive literature and prices by return mail.

### IRVIN ROBBINS & COMPANY

10th Street and Canal,

Indianapolis, U. S. A.

# EISEMANN



The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

### The Eisemann Magneto Co.

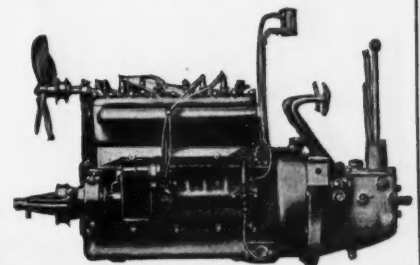
Sales and General Offices  
32-33rd St., Brooklyn, N. Y.  
New York City Indianapolis, Ind. Detroit, Mich.  
122 W. 32nd St. 514 N. Capitol Ave. 509 Woodward Av.

## A Light Car Motor with Self Starter

## GBS Gearless MOTORS Balanced Silent

THIS latest addition to the GBS motor family is Model D, 4 cyl., 3 1/4" x 4 1/4", en bloc, detachable cyl. head, extra large bearings, unit power plant, 3 pt. support. Electric self starter if desired. High grade throughout. Write for details.

Golden, Belknap  
& Schwartz Co.  
Detroit, Michigan



## PENNSYLVANIA Oilproof VACUUM CUP TIRES

Making their  
mark everywhere

Guaranteed for  
4500 miles

Pennsylvania  
Rubber Company  
Jeannette, Pa.



## Hyatt Quiet Bearings

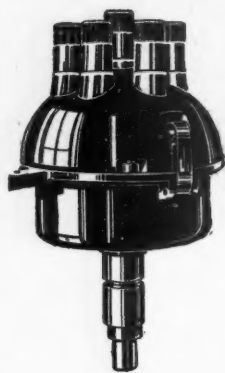
### HYATT SERVICE STATIONS

Atlanta, Ga.	Detroit, Mich.
Boston, Mass.	Los Angeles, Cal.
Chicago, Ill.	New York, (Harrison, N. J.)

Hyatt Quiet Bearings are used in the majority of American made Automobiles

SERVICE AGENTS  
High Wycombe, England  
Broom & Wade  
Minneapolis, Minn.  
Pence Automobile Co.

**HYATT ROLLER BEARING CO.**  
DETROIT, CHICAGO  
NEWARK, N.J.



### The Atwater Kent Ignition System

Adopted by 60 Manufacturers in the Past Year

4934 STENTON AVENUE  
PHILADELPHIA, PA.

## HOUK Detachable WIRE WHEELS

The wheel that makes any car modern

GEORGE W. HOUK COMPANY  
1702 Elmwood Avenue, Buffalo, N. Y.

### O-LAX "Carbon Remover"

A new scientific method of removing carbon.

**"Is Absolutely Guaranteed"**

A proven success. Once used always used.

*Contains No Acid. Will Not Injure Metal.*

Send \$1.00 for Trial Can and Be Convinced

The best dollar you ever spent on your motor. A few drops of O-LAX on a hot, badly carbonized spark plug will prove its merits immediately.

QUARTS	HALF GALLONS	GALLONS
\$2.50	\$4.50	\$8.00

Distributors wanted for all parts of the United States.

**Wilkes & Grant Company**

*Manufacturers*

601-603 E. Broadway

Louisville, Kentucky

# Inter-State

We have a money making proposition for every live dealer in the country. It will pay YOU to investigate it NOW.

**Inter-State Motor Company**  
Dept. C Muncie, Indiana

New Edition—

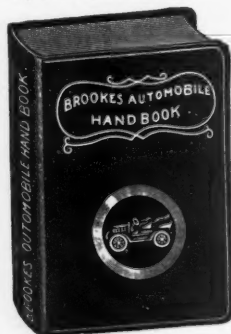
## The Automobile HAND BOOK

By L. ELLIOTT BROOKES  
Assisted by Other Well Known Experts

Revised and Enlarged New Edition—The largest and most practical work published—Used by all up-to-date automobile schools as their every-day text-book. 700 pages and over 320 illustrations. Full Leather Limp, Round Corners, Red Edges.

THE CLASS JOURNAL CO.  
910 S. Michigan Ave. Chicago  
(89)

PRICE, \$2.00



## Electric Auto-Lite Starting—Lighting—Ignition

Electric Auto-Lite equipment for automobiles is as famous for the service that backs it as for the reliability and economy of its operation.

**ELECTRIC AUTO-LITE COMPANY**

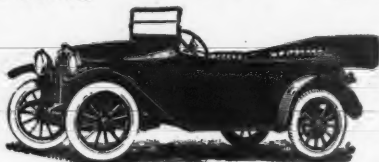
Home Office and Factory: Toledo, Ohio

New York Detroit Kansas City San Francisco

### The *Detroit* — \$985

With Westinghouse  
Starting and  
Lighting System

FIRST  
Pure  
European  
Streamline  
in This  
Country



FIRST  
Long-  
Stroke  
Ball-  
Bearing  
Motor

Full Floating Rear Axle, Platform Rear Spring Suspension, All Recording Instruments in One Unit, Red Electric Flash Oil Gauge, Carburetor Above Frame, 112 Inch Wheel Base, Left Hand Drive, Center One-Lever Control, Multiple Disc Clutch in Oil, Less than 2300 Pounds, 32 H. P.

**Briggs-Detroit Co., 455 Holbrook Ave., Detroit, Mich.**

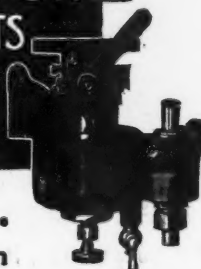
Write for Catalog and Proposition

## HOLLEY CARBURETOR

NO MOVING PARTS  
ONLY ONE ADJUSTMENT

WRITE FOR  
PARTICULARS

**Holley Brothers Co.**  
Detroit Michigan







**THE RUTEMBER MOTOR**

possesses the virtue of economy in first cost and in subsequent up-keep, revealing the merit of sterling quality in every detail of construction and renders as consistent and efficient service as motors costing twice as much to buy and maintain.

**THE RUTEMBER MOTOR CO., MARION, INDIANA**



**Braender Tires & Tubes**

**SERVICE and SATISFACTION**

The Only set of Tires to complete the entire 500-mile race at Indianapolis, May 30, 1913. Consider that 88 Tires of other makes were changed in this Race. Our "Victory Folder" explains other races.

**Braender Rubber & Tire Co.**  
Main Office & Factory **Rutherford, N. J.**  
New York, 250 W. 54th St. Chicago, The Alfredal Co. Boston, Dayton Tire Co. Pittsburgh, Keystone Motor Supply Co. Indianapolis, Brant Bros. Columbus, O., Franklin Rubber Co. Troy, N. Y., G. H. Snyder. Newark, N. J., Ketcham & Lawrie.

**Established Agents Solicited**



**Cartecar**

**The New Gearless Transmission Cartecar for 1915**

Driven by "Wheel and Disk"—with 12 years of success behind it. New Streamline Body. Delco Electric System Starting and Lighting. Full Equipment. Big Tires, Roomy.

**Model Nine**

Some Territory Open, Deliveries at Once, Get Busy  
Write for our proposition and "The Transmission Tells the Story"

**Cartecar Company** Pontiac Michigan **\$1,250**

**PAIGE**

**Model "36" \$1195.00**

A car whose design and construction is so far ahead of others at its price that it is in a class all its own. Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

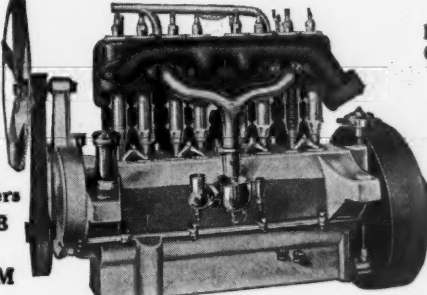
**Model "25" \$925.00**  
Including Electric Starting and Lighting System

This model has made the Paige reputation. Such a sturdy, powerful, comfortable car has never been offered the public at anywhere near its price. \$925.00 with complete equipment.

**Splendid Agency Proposition**

**Paige-Detroit Motor Car Co., Detroit, Mich.**

## Brennan Standard High Grade Motors



Large Bearings  
Long Stroke  
4 and 6 Cylinder

Our leaders  
**MODEL B**  
4 1/2 x 5  
**MODEL M**  
4 x 5

High Grade 4 Cycle Motors

FOR  
Elmore Cars, Warren, Corbin, White Steam Cars and standard makes of cars and trucks, also transmission gears

4 Cyl., 5x5, 40 H. P., 4 Cyl., 4 1/2 x 5, 35 H. P.

**BRENNAN MOTOR MFG. CO., Syracuse, N. Y.**

**1915 PREMIER WEIDELY \$2700**  
**6.49 \$2385**

Six cylinder, stream line body, left side drive, center control, unit power plant, three point suspension, electric lights and starter, one man top, clear running boards.

**PREMIER MOTOR MFG.CO. INDIANAPOLIS.**



**THE STAR**



**COMPLETE THRUST BEARING**



**RADIAL RETAINERS**

**The Star Ball Retainer Co.**  
Lancaster, Pa., U. S. A.

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings**



**SPEEDSTER**  
**TOURING CAR**  
**\$850**

**The Vulcan 27**  
"The World's Greatest Light Car"

1914 is to be the year of the Light Car—the low upkeep car—the **VULCAN**

Send for catalog and generous dealers' proposition.  
**VULCAN MFG. CO., Painesville, Ohio Lock Box MA477**

## DYNETO

Size, weight, efficiency and price considered the Dyneto single unit starting and lighting system literally transcends any other device or combination of devices on the market.

**DYNETO ELECTRIC COMPANY**  
**SYRACUSE NEW YORK**

Our engineering department is at the service of any manufacturer having electrical problems of any character.

# Lexington

CRITERION OF ITS CLASS

Light Six—\$1875

Light Four—\$1375

Six Supreme—\$2575

All equipped with the Moore Multiple Exhaust

*Write for Details and Co-operative Dealer Proposition*

**The Lexington-Howard Co.** Eighteenth Street West  
 Connersville, Ind., U. S. A.

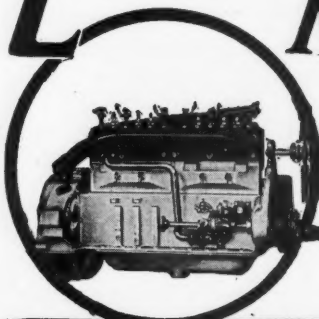
## Prest-O-Lite

is the most  
**ECONOMICAL**  
 Lighting System

All the facts on  
 All lighting systems  
 mailed you on request

**The Prest-O-Lite Co., Inc.**  
 233 Speedway Indianapolis, Ind.  
 (Contributor to the Lincoln Highway)

# Continental Motors



**FOURS**  
 Model U, 2 1/2 x 4      Model C, 4 1/4 x 5 1/4  
 Model N, 3 1/2 x 5      Model E, 4 1/4 x 5 1/4  
 Model N, 3 1/2 x 5      Model T, 5 x 5  
 Model C, 3 1/2 x 5 1/4      Model T, 5 1/4 x 5 1/4

**SIXES**  
 Model 6-N, 3 1/2 x 5      Model 6-C, 4 1/4 x 5 1/4  
 Model 6-P, 3 1/2 x 5 1/4

**Continental Motor Mfg. Co.**

Detroit, Michigan  
 Factory Representative, K. F. Peterson,  
 122 S. Michigan Ave., Chicago

# MARMON

"The Fastest Riding Car In The World"

**"41"**

**\$3250**

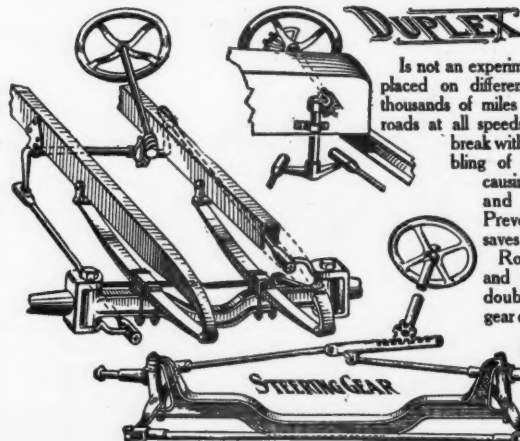
152" Wheelbase

**"48"**

**\$5000**

145" Wheelbase

**Nordyke & Marmon Company**  
 Indianapolis (Established 1851) Indiana  
 "Over Sixty Years of Successful Manufacturing"



**ALWAYS SAFE**

Is not an experiment. It has been placed on different cars and driven thousands of miles over all kinds of roads at all speeds. Any part may break without danger. Wobbling of the front wheels, causing car to leave road and upset, avoided. Prevents accidents and saves human life.

Royalty for use of this and other devices for doubling the steering gear on all makes of cars.

Address  
**Henry T. Hazard**  
 Patentee

255 New Hampshire Av.  
 Los Angeles  
 California  
 Care of Duplex Motor Car Co.

# SALISBURY

**AXLES WHEELS  
 PROPELLERS**

**Salisbury Wheel & Mfg. Co.**  
 JAMESTOWN, N.Y.

# Corcoran Lamps

**GAS, OIL, AND ELECTRIC**  
 CORCORAN LAMP CO.  
 CINCINNATI, OHIO





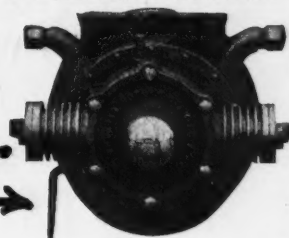
When You See  
**"NON-SKID"**  
 Think of  
**Firestone**  
 The Imprint of Safety

Multiplied mileage—with the surest skid protection you can buy. Extraordinary value—ordinary price. Write for the reasons.

**Firestone Tire & Rubber Co.**  
 AKRON, OHIO  
 Branches and Dealers Everywhere.

Start by the Push-Button Route  
 with a

**Thurber Starter**



The Thurber Rotary Air Starter and Tire Inflator will start your car under any weather conditions. Spins the motor over 200 R. P. M.

Can be attached to any car any time

**NORTHERN ENGINEERING WORKS**, Manufacturers,  
 18 Chene Street, Detroit, Mich.

**W. S. MARTZ SALES CO.**,  
 Chicago Agents,  
 2900 S. Michigan Ave., Chicago

**SHALER \$3.50**  
 Safety Vul-Kit  
**Vulcanizer**

**Save Tires—Saves Repair Bills**

Repairs punctures, blow-outs and cuts in casings or tubes, perfectly—makes repair strongest part of tire. No watching, no regulating, automatic in operation. Impossible to undercure or overcure. Has no open flame—no danger if accidentally upset. Anybody can use it. Furnished complete at \$3.50 with all repair material. Investigate.

Send for Book "Care and Repair of Tires"—its free.

**C. A. SHALER CO.** 241 Fourth St. Waupun, Wis.

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop  
**TWITCHELL AIR GAUGE**  
 and save your tires



"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

FOR SALE BY JOBBERS, DEALERS, GARAGES, OR

**The Twitchell Gauge Co.**  
 1201 Michigan Avenue CHICAGO, ILLINOIS



**Racing Type Roadster Seats**

Adapted to all makes of cars. By removing touring car body may be used to transform any touring car into a roadster. Make a handsome racing type speedster of any Ford car. Durable, weatherproof, comfortable. 16" wide, 17" deep, 18" or 21" high, as desired.

Upholstered in Mule Skin, enameled any color, pair.....\$28.00  
 Hand buffed leather.....\$25.00

**Auto Parts Company** 737-739 W. Jackson Blvd.  
 CHICAGO



Ford buyers to share in profits of the Company. Ask nearest Ford dealer for particulars.

Ford Runabout.....\$440  
 Ford Touring Car.....490  
 Ford Town Car.....699  
 Ford Coupelet.....750  
 Ford Chassis.....410

F. O. B. Detroit, all cars fully equipped.  
 (In the United States of America Only)

**Ford Motor Company**  
 Detroit, Mich.

**FEDERAL**  
*Double-Cable-Base*  
**TIRES**

NO MORE SIDE-WALL BREAKS—RIM CUTS—  
 PINCHED TUBE—BLOW-OFFS

**Federal Rubber Manufacturing Co., Milwaukee**  
 Branches, Service Stations and Distributors at all Principal Points.



THINK THOUSANDS OF MILES  
 AHEAD, AND YOU WILL BUY  
**REPUBLIC MILEAGE**  
 PLAIN AND STAGGARD TREAD  
**TIRES**

**THE REPUBLIC RUBBER CO.**  
 YOUNGSTOWN, OHIO.

BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES.



## Steel Protectors

Each section 2 in. wide,  $\frac{1}{8}$  in. thick. They hook to rim. As flexible as ever. Anti-Skid, Can't Blow Out or Rim Cut.

### HOW CAN THE RUBBER WEAR OFF IF IT IS COVERED WITH STEEL?

Try 2 or 3 sections over any old blowout  
Special prices to the first in new territory  
Kimball Tire Case Co., 172 E. Hwy. Council Bluffs, Ia.



Tire covered complete

# Polarine

FRICITION REDUCING MOTOR OIL

Maintains the correct lubricating body at any motor speed or heat

## STANDARD OIL COMPANY

(AN INDIANA CORPORATION)

\$2500

\$2500



More Power  
More Flexibility

More Economy  
More Silence

Guaranteed 50 horsepower, 128-inch wheel-base, four speeds, 36 x 4 $\frac{1}{2}$  inch tires, Bosch ignition, Wagner electric starter, no valves to clog or grind, simpler parts, fewer parts. Touring Car and Roadster \$2500, Sedan \$3250, Limousine \$3800.

Moline Automobile Co., East Moline, Ill.

# KINGSTON

## CARBURETOR

### Save Money by Economizing Gasoline

Four floating bronze ball valves opening automatically under different motor suction supply a uniform mixture at any speed, regardless of hot, cold, wet or dry weather.

Write for details and let us tell you why so many manufacturers are adopting this carburetor as standard equipment

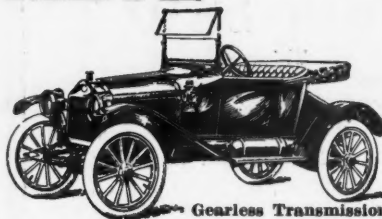
Made by the oldest manufacturers of carburetors in America  
ESTABLISHED 1895

BYRNE, KINGSTON & COMPANY, Kokomo, Indiana

## METZ "Twenty-Two" Roadster

WINNER OF THE GLIDDEN TOUR

# \$495



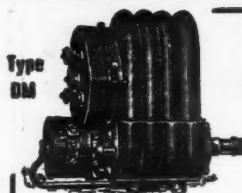
Gearless Transmission

Equipped Complete

Fore-door body, extra thick tufted upholstery, plate glass rain-vision wind shield, left-hand drive with center control, 4-cylinder, 22 $\frac{1}{2}$  H.P. water-cooled motor, Bosch magneto, Prest-O-Lite tank, extension top, full elliptic springs, artillery wheels, best quality Goodrich clincher tires, 6 lamps, horn, pump, jack, tools. Speed, 50 miles per hour. Best 'em all at climbing hills. Secure EXCLUSIVE SALE in your territory. Write for terms and Catalog "K."

METZ COMPANY

WALTHAM, MASS., U. S. A.



Type OM

## HEINZE



The performance of HEINZE IGNITION APPARATUS for the past ten years justifies our claim that our product is superior in both points of construction and efficiency.

## HEINZE ELECTRIC COMPANY

SALES OFFICES—DETROIT, MICHIGAN  
FACTORY—LOWELL, MASS.

Service Stations—New York, Detroit, Chicago, Kansas City.

# "Bridgeport"

BRASS  
TRADE MARK  
CO. U.S.A. U.S.A.

## TIRE PUMPS

Are easy to use and easy to sell. They are durable and efficient and are widely advertised. The cylinders are of seamless brass tubing which cannot rust. The "Stapley," the "Aeolus," "Windjammer," etc., give lasting satisfaction. Carry them in stock.

Bridgeport Brass Company  
P. O. Box A Bridgeport, Conn.

## Wisconsin

CONSISTENT

## MOTORS

### Dependability

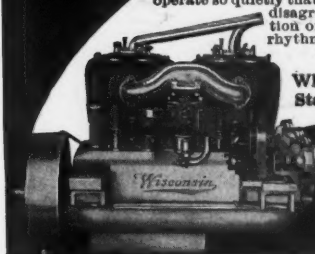
After all it is the motor that keeps on going that makes automobiles and motor trucks a success. Wisconsin Motors, both the auto type and the truck type, have proven that they are

ABSOLUTELY CONSISTENT

You can always rely upon them. You can always be sure that you will keep on going. When you hear one running—and they operate so quietly that it's hard to hear them—you never hear that disagreeable "thump" which accompanies the operation of so many motors—you hear nothing but the rhythmic purr of a perfectly constructed motor.

Complete catalog upon request

WISCONSIN MOTOR MFG. COMPANY  
Sta. A—D-47 Milwaukee, Wis.



## MORE MILES —LESS GAS



# The Clearing House of the Motor Car Industry

*For Second Hand Cars Surplus Parts, Accessories, Tires,  
Machinery & all other Special Announcements of a Similar Character*

**ADVERTISING RATES** ¼ inch—One time \$2.40. 1 inch—One time \$4.50. 1½ inches—One time \$6.75. 2 inches—One time \$8.75.  
Rates for other spaces and longer terms furnished upon request.

## CARS FOR SALE

**Attention, Dealers and Agents**  
**STOP! Losing money on Second-Hand Cars.** Get the "Used Car Central Market Report," a book which shows you what cars are selling for in Chicago—the "Great Central Market." This service will save you, on a single deal, more than its cost for an entire year.

For Particulars Write

**CHICAGO AUTOMOBILE TRADE ASSOCIATION**  
2422 Michigan Avenue Chicago

**Auto Bargains** | **New Cars at ½ Price**

Greatest values in new cars ever advertised are shown in our sales rooms now. They are selling at prices that demand your

### IMMEDIATE ATTENTION

Write for special lists of new guaranteed automobiles and motor trucks.

## Times Square Auto Co.

S. W. Cor.  
Broadway & 56th St.  
NEW YORK

1210-1212  
Michigan Ave.  
CHICAGO

**CHALMERS 1913 5-PASS., 6-CYLINDER, RE-**  
painted and in excellent condition. This car has always had the best of care and is a bargain at the price we are quoting.

**CONDON, 2635 Wabash Ave., Calumet 5311**  
**FOR SALE**—One five-ton White truck, practically new, fitted to haul lumber; also with new passenger body, fitted to haul passengers; also one five-passenger Thomas touring car in good condition; either or both will be offered at low prices. Call on or address Seger Bros., Ligonier, Pa.

**FOR SALE—MARMON TOURING CAR, 1912**  
model "32," four-cylinder, five-passenger, in good condition. A bargain for someone.

Address Box E-224, care of Motor Age

**FOR SALE—A BEAUTIFUL SEVEN-PASSENGER**  
White Steam car, Model M.M., in A-1 condition. Practically as good as new. A fine bargain for someone.

Address Box E-225, care of Motor Age

### GET OUR LATEST BULLETIN OF USED CARS

You will surely find one to fit your requirements. You can get from us good, serviceable machines of various makes for \$400 and up. Let our reputation be your guide.

**PACKARD MOTOR CO. OF CHICAGO**  
2367 Michigan Ave., Chicago, Ill.

**GUARANTEED AUTOMOBILES, \$50 UPWARD.**  
Engines, \$15.00. Axles, wheels, coils, any part you want, dirt cheap.

**PROGRESS BROKERAGE CO.**  
527 Grant St. Buffalo, N. Y.

**Mitchells, Rebuilt, Guaranteed**  
These cars are fully equipped. Call or write for further particulars.

**MITCHELL AUTOMOBILE CO.**  
2334-36-38 Michigan Ave. Chicago, Ill.

**ONE 20 H. P. WHITE STEAMER**  
One 40 H. P. White Steamer; one 30 H. P. White gas car. Address.  
Box E 191 care Motor Age

### REO TRUCK \$200

Car in No. 1 condition. This car must be sold at once; guaranteed; demonstration.

**RAY THOMAS**  
1176 E. Main St. Columbus, Ohio

### WHITE STEAMER

Slightly used parts at less than half of new prices. Good condition and assortment.

Address Box E-160, care of Motor Age

## MACHINERY

**50 LINCOLN MILLING MACHINES**  
\$50.00 Each

Send for photo and description  
**LUCAS & SON, 5 Fox St., Bridgeport, Conn.**

## MAGNETOS

A general clean-up in our 1914 stock. All makes of high and low tension magnetos. New and used coils for battery and ignition. Will all be sold at cost while they last.

**Pellet's Magneto Exchange**  
1606 Michigan Ave. Chicago, Ill.

### MAGNETOS

Repaired, remagnetized; prompt service on all makes. Get our exchange proposition on new K-W for old equipment.

Spark Coil, Storage Battery and Carburetor Repairs.

Northwestern Distributors.  
K-W Magnetos, Schebler Carburetors, Vesta Lighting Equipments.

Kellogg Self Starter and Tire Inflators.

**REINHARD BROTHERS CO.**  
Minneapolis, Minn.

## MAILING LISTS

**Ask for Special Price List**  
Auto Owners, Ford Owners, Ford Dealers, all other dealers, Garages, Repairs, Supplies, Manufacturers, Jobbers, anything pertaining to the Auto Trade.

**Auto List Dept. A. F. Williams, Mgr.**  
166 West Adams Street CHICAGO  
Phone Franklin 1182

**MAILING LISTS AND STATISTICS.** Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of electric, trucks, Fords, Studebaker, Overlands, etc. **MOTOR LIST CO. OF AMERICA, 1107 Locust St., Des Moines, Iowa.**

## MOTORIST'S BOOKS

**A. L. DYKE'S AUTO INSTRUCTION.** A new idea of instructing you with working models to care for and repair automobiles. Simplified instruction on self-starters and lighting just added. Send for free 32-page illustrated booklet. **A. L. Dyke, Box 16, Roe Bldg., St. Louis, Mo.**

### Ford Model T Reference Book

Second edition. A manual on care, repair and operation. Makes you master and mechanic of Ford Model T. Details dismantling and assembling of its mechanical parts. Troubles located and readily remedied by digest index. Circular on request, or sent postpaid, \$1.00.

**FORD REFERENCE BOOK CO.**  
57 W. 125th St. New York, N. Y.

**THE PRACTICAL HAND BOOK**  
of Gas, Oil and Steam Engines.  
Send for complete circular.

**CHARLES C. THOMPSON CO.**  
1130 S. Wabash Avenue, Chicago, Ill.

## MOTORIST'S CLOTHING

### FUR LINED OVERCOATS

Limited quantity Manufacturers' samples. Black broadcloth outside, lined throughout with Mink dyed marmot. A beautiful Fur, like Mink. Large Persian lamb collar. Making a handsome coat, suitable for Dress wear or driving. All sizes.

**\$27.50**

Would retail for \$60.

**SENT ON APPROVAL**  
You take no risk. Examine and try on before paying. Write today, stating size, enclosing 50c. for express charges only, and coat will be sent at once. Few large size Fur robes, \$15 each, worth \$30.  
**E. HART, Dept. E, 1328 Broadway, New York**

## PARTS AND ACCESSORIES FOR SALE

**AAA SPEEDOMETERS AAA**  
Send for special price list of Speedometer Parts.  
**GENERAL SPEEDOMETER REPAIR CO.,**  
53 W. 63rd St., New York City

**ACCESSORY CATALOG**  
Mailed on request. Dealers, send list of wants for special prices. Westchester cup grease, bbl. lots, 4c pound. **WESTCHESTER ACCESSORIES CO., 1777 Broadway, New York City.**

**AGENTS AND DEALERS**  
We announce a reduction of from \$20.00 to \$14.00 on our Spare Remountable Wheels for the Ford. We have some good territory left. Why not handle an original line. Carry extra wheel with tire on ready and interchangeable with any of present wheels. Can install outfit at home, then change wheels in less than two minutes. Write for catalogue. Legitimate dealers, get our agency for Spare Wheels, Spring Radius Rods, Fan Belts Radiator Cradles, etc. **"ANGIER'S," Dept. B, Streator, Ill., U. S. A.**

**ALL SEASONS RECORDS MADE WITH**  
Schebler equipment. Why not get a Schebler model R for your car? Our exchange proposition makes it easy.  
**J. C. NICHOLS, Direct Factory Distributors,**  
1673 Broadway New York

# The Clearing House—continued

## Advice for Sick Auto

1,638,111 Different  
Auto Repair Parts

Largest Stock in the World  
BESIDES

Accessories, Supplies  
All Kinds, at a Price

6-cyl. motors	\$175.00
Weston-Mott rear axles	20.00
1-Beam front axles	10.00
Splitdorf, Remy and Briggs coils	6.00
Guaranteed spark plugs, all sizes	.19
Complete tool kits	1.00
Tool boxes	1.20
Tool boxes, 29x12x10	1.50
Oval gasoline tanks, 16x11x30	2.75
Motor driven electric horns	7.50
Vibrator horns	2.49
Rumble seats	3.50
Double action tire pumps	1.75
Oil guns	.50
Stewart gasoline savers	3.50
Stewart speedometers	10.00
Fenders and wheels for many cars, price each	3.00
\$75.00 electric starters	14.10
Front bumpers	5.00
Pressed steel frames	5.00
Deaco automatic cutouts	1.30
Battery and magneto switches	1.50
18" steering wheels	2.00
17" steering wheels	1.50
Auto jacks with handle	.90
Jacox steering gears	8.19
Klingston and Fletcher carburetors	3.95
Ford floor mats	.90
Ford hub caps	.10
Electric head lamps, pair	6.50
Gas head lamps, pair	5.00
Robe and foot rails	.35

Thousands of Other Bargains  
Send for Catalogue

## Puritan Machine Co.

DETROIT

ALL PARTS ALL CARS

American Underslung and Marion  
Motor Car Parts and Service.  
CHARLES E. RIESS & CO., Inc.  
1690 Broadway, New York

## "American Underslung" Motor Car Owners

American Motors Company now re-organized under new management.

We are prepared to furnish first-class service for all repair parts for American Underslung cars.

Eastern owners can get first-class service by writing our Eastern Branch at 2200 Diamond Street, Philadelphia, Pa.

For prompt, first-class service write direct to our factory, South Meridian Street and Belt R. R.

New Cars built only on special order.

American Motors Parts Co.  
Indianapolis, Indiana  
S. Meridian St. and Belt R. R.

## ALL PARTS IN STOCK AT DISCOUNT

Atlas, Bergdoll, Chalmers, Ewing, Alco, Packard, Hudson, Herreshoff, etc. Timken Axle Parts. Brown-Lipe Gear Parts. Continental Motor Parts. STA-RITE Rings, \$1.00 each. Regular Piston Rings, 30c each.

JOS. C. GOREY & CO.,  
354 W. 50th St. New York City

ANY AND ALL PARTS FOR 1912  
Cadillac, 60% Off List Price  
Backus Novelty Co., Smethport, Pa.

## AT HALF PRICE

200 Storage Batteries, all makes, new and used, 6-80 to 6-160, \$5.00 to \$12.00. We exchange new batteries for old ones.

SIMPLEX BATTERY CO.  
120 E. 33rd Blvd. Chicago, Ill.

ATTENTION, HENRY OWNERS  
We are prepared to fill orders promptly for repairs for Henry cars.

MUSKEGON AUTOMOBILE CO.  
Muskegon, Mich.

AUTO BODIES AND TOPS  
Mohair Tops for runabouts, \$20.00; Mohair Tops for touring cars, \$30.00; Racing Seats, per pair, \$18.00; Touring Bodies, \$100.00; Runabout Bodies, \$50.00. AMERICAN AUTO TOP MFG. CO., 1451 W. Washington Blvd., Chicago, Ill.

## AUTO PARTS

Motors 4½x5, four cylinders, at.....\$198.00  
Pressed steel frames at..... 15.00  
Steering gears, complete (R. H.), at..... 12.50  
Radiators for 30 H. P. cars at..... 11.00

Parts of all kinds, including axles for small cars  
Also the following

SPECIAL FAST SPEEDSTERS  
Car to go not less than 70 miles per hour..\$1250  
Racer to go not less than 90 miles an hour. 3500  
Above cars are new, not used or second hand.

G. J. G. Motor Car Company  
WHITE PLAINS, N. Y.

## AUTOMOBILE PARTS

MICHIGAN, MORA AND  
DRAGON PARTS IN  
STOCK

We maintain a complete stock of parts for the above cars.

PHILADELPHIA MACHINE WKS.  
67 Laurel Street, Philadelphia, Pa.

AUTOMOBILE REPAIR PARTS  
Send broken parts—we will duplicate promptly.  
TIRES, what size—we save you money—try us.  
AUTO PARTS CO.  
1404 Henn. Ave. Minneapolis, Minn.

AUTO SALVAGE COMPANY  
1436 Wabash Ave., Chicago, Ill.

2-Cyl. Buick parts. 50 H. P. Simplex Engine parts for sale. Mea Dual Magneto, \$35.00. D4 Bosch, \$35.00. 30 H. P. Mitchell Engine with clutch and magneto, \$75.00. 1909 Mitchell 3-speed select transmission, \$40.00. 35 H. P. Pope Engine, \$75.00. Flanders parts. Maxwell 4-cyl. unit power plant, \$100.00.

AUTO TIRE EXPENSE REDUCED  
ONE-HALF DURABILITY  
OF TIRES DOUBLED

Possibility of punctures and skidding reduced to a minimum by the use of my tire preservative which you prepare yourself from simple ingredients. Costs 15c a gallon. Applied without removing wheels or tires. One gallon sufficient for four tires. Acts on rubber exactly as creosote does on wood. Formula will be sent immediately upon receipt of one dollar.  
JOHN ALEXANDER  
159 E. Chicago, Ave. Chicago, Ill.

## Another Lot Of Bargains

10 Days Only

## Magnetos

New 4 cyl. Briggs magneto and coll.	\$19.50
New 6 cyl. Briggs magneto and coll.	19.50
New 6 cyl. U & H high-tension	23.50
2 cyl. Remy magnetos	13.50
Remy magneto coil with switch	6.00
A. R. H. Bosch magneto	17.50
New Apple Electric generator with cutout	28.50
Atwater-Kent type K coll.	11.50
2 cyl. Lee Noxton vibrating coils	2.50

## Carburetors

1¼" Marvel Vertical, flange connection	4.00
1¼" Kingston Vertical, flange connection	4.00

## Motors

4 cyl. Rambler motor, overhead valves, second-hand	65.00
New 2 cyl. opposed Randolph motor, 20 H. P.	60.00
New 4 cyl. Buda motor, 4½x5½", supporting arms 24" wide	125.00
4 cyl. Milwaukee motor, 4¼x4½"—used, but in A1 condition	75.00
2 cyl. 3¼x3¾" A. C. motor, opposed	34.00
New Speedwell steering gears, R. H. 41" long—18" wheel	12.50
Same as above, less wheel	9.00
Shopworn Warner steering gears, R. H., 56" long, suitable for Roadster	8.00
16" steering wheels, 4 arm spider	1.00
Auto creepers, hardwood with steel casters	.80
1 doz. end wrenches, ¼" to 1"	1.00

## Bodies

New Roadster bodies, 32x86, upholstered and painted	57.50
American Scout bodies, upholstered	57.50
New Haynes, 5-passenger body, upholstered	90.00
New Stad 5-passenger, will fit Ford or Krit, upholstered and painted	50.00

## Wheels

New Mitchell clincher, metric size, send dimensions, set of 4	7.00
1 set 38x4½" wire wheels for American car, 16" drums, bearings and caps	65.00
Transmission levers, 3 and 4 speed, side control, set	5.00
1" ball and socket drag links	.80
48 tooth sprockets, 1x¾x¾, 12" hole	1.75
48 tooth sprockets, 1x½x¾, 12" hole	2.00
48 tooth hardened bevel ring gear, from stock	3.00

ANNULAR BEARINGS, CUPS AND CONES—SEND SAMPLE OR SIZE.

If you have not received our bulletin write today  
50% with order, balance C. O. D.

## AUTO PARTS COMPANY

737-39 WEST JACKSON BOULEVARD  
CHICAGO, ILL.



# The Clearing House—continued

## AUTO TOPS BUILT and REPAIRED

Seat covers and body building, remodeling and trimming. Write for prices.  
**BITLEY TOP & BODY CO.**  
 1342-4 W. Jackson Blvd. Chicago, Ill.

## BALL BEARINGS REGROUND

We guarantee them as  
**GOOD AS NEW**  
 All sizes and makes in stock ready for immediate delivery—At prices that will interest you.  
**AHLBERG BEARING CO.**  
 2636 Michigan Ave., Chicago. 1790 Broadway, New York. 805 Woodward Ave., Detroit. 93 Massachusetts Ave., Boston. 1841 Euclid Ave., Cleveland, Ohio.

## BARGAINS! BARGAINS!

New 5-passenger, upholstered and painted bodies, will fit Ford car.....\$51.00  
 Double upholstered seat..... 20.00  
 Racing seats, upholstered and enameled.. 25.00  
 Shock absorbers for Ford cars..... 6.00  
 Sure fire spark plugs, set of four..... .85  
 Square side oil lamps, pair..... 4.00

### U. S. AUTO SUPPLY CO.

182 Grand River Ave. Detroit, Mich.

## BATTERY BARGAINS

We are selling our 1914 stock of lighting and ignition batteries at a big reduction. Only a few more on hand—half price, \$5.00 to \$16.00. Limited number of Elba starting and lighting batteries at cost. Write today.

### THE AMPVO BATTERY CO.,

3031 Michigan Ave. Chicago, Ill.

## BUILD YOUR OWN CAR

### Exceptional Prices for Light Car Parts

Rear and front axles, complete with wheels, frame and springs.....\$47.50  
 Pressed steel frames, 28x120..... 5.00  
 Mufflers with cutout..... 1.50  
 Speed car bodies..... 9.50  
 Remy and Splittorf magnetos..... 15.00  
 Foot rails..... .30  
 500 assorted bolts, nuts, screws and rivets..... .75  
 Tool boxes, 22x9x10..... 1.25  
 18-inch steering wheel rims..... .50  
 Ford lighting outfits, complete..... 2.75  
 Connecticut kick switches..... 1.00

Service parts for most cars

### ADVANCE AUTO PARTS CO.

109 Charlotte Ave. Detroit, Mich.

CoCoa and Carpet Mats, Hand Made Seat Covers, Auto Tops Built and Repaired.

### AUTO CAPE TOP CO.,

2334 Michigan Ave. Chicago, Ill.

## Cut Prices on Auto Parts

De Temple axle parts, Brown and Lipe transmission gear and parts, Spicer universal joint parts, roller bearings (all makes and sizes). Send broken parts; we will duplicate promptly and will save you money. Try us.

### G. J. G. MOTOR CAR COMPANY

White Plains, N. Y.

## DESIGN FOR LIGHT CAR

The designer of three successful cars will sell a limited number of complete sets of prints for a four cylinder light car. Shaft drive and handsome and up-to-date design, composed of standard units easily obtained and reasonable prices. Complete set of prints, list of parts and where obtained for \$5.00. Money returned if not satisfactory. Send for information and sketch of car.

Fenton Engineering Co., Fenton, Mich.

## CUT PRICES

Send for our illustrated cut price auto supply catalogue.  
**Liberty Tire & Supply Co.**  
 100 Chambers St. New York, N. Y.

## DETACHABLE TONNEAU

Get Our Circular  
**"THREE FORDS IN ONE"**  
**FORD DELIVERY BODIES**  
**\$75—Painted Complete**  
 Also Racing Bodies  
**AUTO REMODELING CO.**  
 1501-5 Michigan Ave. Chicago, Ill.

## ELK TERMINAL

Saves trouble, time and money. No soldering. No tools necessary.

Clamps automatically. Tests your spark plug without stopping the motor, or getting a shock. Price 25 cents. A necessity for every owner and garage.

Send for Circular

**THE SOLE DISTRIBUTING CO., INC.,**  
 Dept. D.

1789 Broadway, N. Y.

## F. & H. WIRE WHEELS

Equipped with F. & H. Special Wire Wheel Rims. Adaptable to any car. Complete equipment for Ford cars.

**THE F. & H. WIRE WHEEL CO.**  
 Columbus, O.

## Ford Automobile Specialties

are guaranteed satisfactory or money refunded. Write for free catalog.

**Auto Parts Co., Providence, R. I.**  
 The Largest Ford Specialty Makers in the World

## FORD DELIVERY BODIES

12 styles, all sizes. Agents wanted everywhere.  
**COLUMBIA BUGGY CO.,**  
 21-23 Selden Ave. Detroit, Mich.

## FORD OWNERS

Equip your cars with Seat Covers. Our direct to car-owners plan will save you money. Ten thousand satisfied customers last year.

### GLOBE SEAT COVER CO.

Dept. M, RACINE, WIS.

### FORD T RADIATORS \$17.25 NET

We are making the above offer to close out. Radiators are new throughout. Shells for painting. Cast brass bracket supports. Former price \$25.00. Only a few left.

**WRIGHT COOLER & HOOD CO.**  
 8th St., Muskegon, Mich.

## FORE DOOR BODIES

1914 Models, five-passenger, fully upholstered; fit most any car. Cost \$350.00; our price, while they last, \$85.00. Write for full description.

### THE M. & M. COMPANY

480-500 Prospect Ave., Cleveland, Ohio

## Fore Doors for Open Front Cars

Prices right. A postal will bring particulars.  
**ECONOMY SERVICE CO., 2714 Boulevard**  
 Place, Indianapolis, Ind.

**FOR SALE—NEW BOSCH DU 4 IGNITION**  
 Coil, \$12.50. One pair new oil lights, truck size, \$3.50.

### FRANKLIN D. RICE

335 Cincinnati Street Dayton, Ohio

# FORE DOORS

THE F. E. LORTZ COMPANY is getting the bulk of business on Fore Doors this year. You can imagine why—no trouble to put them on. They are built right and don't look like an addition to a barn like some you have seen. Be careful about buying cheap doors. They don't fit your car. Get a set from us and you won't experience any difficulty installing them.

## F. E. LORTZ COMPANY

1627 Michigan Ave. Chicago, Illinois

## FOR SALE

A small number of modern, well designed and constructed six, five and four-passenger touring bodies and comfortable roadsters painted and trimmed. Will change and guarantee to fit your car. Write us.

### IRVIN ROBBINS & CO.

Industrial Building, Tenth and Canal  
 Indianapolis, Ind.

## FOR SALE AT A BARGAIN

New 5x6 four-cylinder, governor-controlled engine, fully equipped, with carburetor, magneto. Will sell for much less than cost. **FRED HANSON, 570 Prior Ave., St. Paul, Minn.**

Grind Your Valves—The American valve facing and seating tools are instantly adjustable to any automobile, motorcycle or truck; perfect and complete work in thirty minutes guaranteed; price \$10; complete set of two tools; C. O. D. express or parcel post; privilege of examination. **The American Valve Tool Company, Stamford, Conn.**

# GUARANTEED RADIATORS

Not always necessary to buy new radiators. New cores can be furnished for frozen or damaged radiators. We build the fin and tube type. Guaranteed copper fins and tube.

We also repair and furnish new cores for Maya radiators.

We build new cores for all makes and for all cars. Get our prices. You will save money.

Cores in stock for many standard radiators such as Hupps, Warrens, Herreshoffs, Buicks, E. M. F. 30, Studebaker, Hudson 20, Cadillacs and several others.

We can build and fit a new core in your radiator in two days—if in stock, in one day.

Write for bargain sheet of accessories.

**HURON RADIATOR & LAMP CO.**  
 253-255 Jefferson Ave., Detroit, Mich.

Terms Cash with the order.

## Guaranteed Honeycomb Radiators

Eliminate your radiator troubles by putting our Honeycomb Radiators on your cars. Every one built right from the ground up, absolutely interchangeable, and will properly cool the motor.

Ford "T".....\$25.00  
 Hudson "20"..... 35.00  
 Hupp "20"..... 25.00  
 Buick 10-24-26-34-35-36..... 27.50  
 Buick 16-17-19-26-27-28..... 37.50  
 Buick 21-28-39-43..... 37.50  
 Parry 42..... 35.00  
 E. M. F. "30"..... 35.00  
 Write us on those not mentioned. We can duplicate any radiator.

## Detroit Radiator & Specialty Company

963 Woodward Ave. Detroit, Mich.

# The Clearing House—continued

## JOBBER AND GARAGES

Get our proposition on fibre gears for all makes of speedometers. We make anything you want from fibre.

**OGDEN FIBRE GEAR & TIRE CO.**  
Columbus, Ind.

## LEAKY AUTO TOPS

No necessity of buying a new top. WATERIZE AUTO TOP DRESSING will make any automobile top absolutely waterproof no matter what condition it is in. GUARANTEED for one year or money refunded.

**BRITISH AMERICAN MFG. CO.**

811 Woodward Ave. Detroit, Mich.

## LET US SEND A GOOD TOP

for your runabout for \$14, or touring car for \$27. Send for Catalog.

**Bison Trimming Co., Buffalo, N. Y.**

# Matheson

**Cars — Repair Parts**

Some Unusual Opportunities for all Models kept fully sized up

**FRANK F. MATHESON, Wilkes-Barre, Pa.**

## Maxwell Owners and Repairmen

Why pay 20 per cent advance for your parts? We can supply 75 per cent of your wants at the old Maxwell-Briscoe list. Stoddard-Dayton transmission and equalizing gear parts at old list. Why pay more?

SEND FOR PRICE LIST

**M. P. SUPPLY COMPANY**  
ATLANTA, GA.

**MORE POWER IS POSSIBLE WHERE THE** cylinders are ground and fitted with new pistons and rings. A smoother, more economical engine is the result. Quality work only. **ACME GRINDER CO., 2325 Harriet Ave., Minneapolis, Minn.**

## MORE SPEED FOR THE FORD

Special ratio Differential Gears for the Racy Type Ford.

2½—1 ratio.....\$15.00 Set  
3 —1 ratio..... 15.00 Set

Absolutely interchangeable with the present gearing

**DETROIT RADIATOR & SPECIALTY CO.**  
963 Woodward Ave. Detroit, Mich.

## NOTICE

**Big Cut in Prices on Fore Doors**

30 DAYS ONLY

Fords, any model.....\$16.50

Any other make..... 21.75

Doors made special for each car

Guaranteed to Fit Order Now

Dept. F

**E. W. SHOWALTER & CO.**

315 N. Penn Street Indianapolis

## Paint Your Car Yourself

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

**Arsenal Varnish Company**

Auto Dept. Rock Island, Ill.

# Liquidator's Sale

**Complete Marquette Auto Plant**

## Extraordinary Price Inducements

I have been authorized to dispose of the entire lot of automobile parts, supplies, accessories, tools, bodies and everything for the automobile, including parts to build a complete car. This is the biggest lot of parts ever offered at direct sale.

Spark Plugs.....	19
End Wrenches.....	15
Magneto Boots.....	50
Dash Air Pumps.....	79
Starting Crank Boots.....	30
Gasoline Strainers.....	50
Tail Lamps, Oil.....	150
Tail Lamps, Electric.....	175
Side Lamps, Oil.....	150
Side Lamps, Combination.....	175
Gas Head Lamps, per pair.....	8.25
Electric Head Lamps, pair.....	7.50
Pressed Steel Frames.....	5.00
Steering Gears, "Gemmer".....	12.19
Steering Gears, "Jacox".....	8.19
Weston Mott Rear Axles.....	40.00
Sliding Gear Transmissions.....	45.00
4 speed sliding gear transmissions with multiple disc clutch.....	50.00
Fore door roadster bodies—in rough.....	20.00
Fore door roadster bodies—painted and upholstered.....	55.00
Touring car bodies—painted and upholstered.....	65.00
Model H High Tension K.W. Magneto.....	18.50
Harford Shock Absorbers—set.....	20.00
E. Z. Rider Shock Absorbers for Ford Roadster and Touring Cars—set.....	15.00
40 H. P. Motors.....	125.00
Exide Batteries.....	5.50
Wheels, all sizes.....	3.00
Front Axles.....	10.00
Electric Horns.....	2.49
Carburetors—Rayfield, Schebler, Kingston and Fletcher.....	5.19
Windshields.....	9.00
Stromberg Carburetors.....	8.19
1-inch Buffalo Carburetors.....	3.00
Oval Gasoline Tanks—11x22x20.....	6.00
Straight High Tension Volta Magneto.....	15.00
4 Cyl. Remy Magneto with coil.....	20.00
Ford Lighting Outfit.....	2.25
Ford Lighting Generators.....	25.00
Ford Wheel Pullers.....	.80
Rayfield Carburetors with Manifold for Ford Model "T".....	8.20
Ford Oil Gauges.....	.80
Ford Spark Plugs.....	.19
4 Cyl. Remy Coils.....	6.00
Splitdorf Coils.....	6.00
Standard Speedometers for 36x4 wheels.....	7.00
Stewart Speedometer Heads.....	3.95
Tool Boxes—18x8x9.....	1.25
Tool Boxes—24x9x8½.....	1.50
Electric Side Lamps—for cycle cars.....	1.00
Brake Lining, per foot.....	.25
Tire Repair Kits.....	.35
Front and Rear License Brackets.....	.85
Steering Wheels.....	1.00
Tire Covers—any size.....	.75
¾ and 1 ½ Brake Rods with clevis.....	.35
Mufflers, 1½ opening.....	1.50
Foster Shock Absorbers, set.....	6.00
Rear Axle with unit transmissions.....	80.00
Assorted spring clips, per doz.....	1.00
100 Assorted Cap Screws.....	.50
100 Assorted Nuts.....	.50
100 Assorted Rivets.....	.20
100 Assorted Washers.....	.35
Erie Pipe Wrenches.....	.25
Watch dog locking device.....	.75
Warner Autometers—complete.....	9.50
Rumble Seats.....	3.50
Tool Boxes.....	1.25
Robe and Foot Rests.....	.35
Auto Jacks.....	1.00
Tire Pumps.....	1.50
Metal Polish—½ and 1 gal. cans, per gallon.....	.50
Auto Soap, 5 and 10 lb. cans, per pound.....	.10
Tool Kits.....	1.09
Tire Chains, many sizes.....	3.09
Bulb Horns—complete.....	.75
Vulcanizers.....	.79
Stewart Gas Savers.....	5.50
Radiators for many cars.....	20.00
Springs—many sizes.....	3.00

Almost Everything at a Special Low Price—  
Send for Big Catalogs

# Alfred O. Dunk

**Liquidator**

412 Lafayette Boulevard  
Detroit, Michigan

This is my fifty-third sale. I have closed out that many factories.

# Original Repair Parts Factory

We furnish repair parts for over 53 models of cars. Own original patterns, tools, etc., including Warren, Elmore, Marquette, Rainier, Welch-Pontiac, Welch-Detroit, F. A. L., Reliable-Dayton, Barnes, De Luxe, Demot, also Michigan, Cutting and many others. Everything for every auto.

**Puritan Machine Company**  
Detroit, Mich.

## PAINT YOUR OWN CAR

We supply material and instruction. Write for particulars. **ECONOMY SERVICE CO., Indianapolis, Ind., 2714 Boulevard Place.**

## RADIATOR BARGAINS

Ford Model T Honeycomb.....\$17.00  
Buick 16-17..... 28.50  
Buick 10 Honeycomb..... 20.00  
Hudson Model 20 and 30..... 28.50

Write for Other Radiator Bargains

**AUTOMOBILE APPLIANCE CO.**  
1436-38 S. Michigan Ave. Chicago

## RADIATORS

WHILE THE STOCK LASTS

Name.	Model.	Price.
Brush.....	All Mod.....	\$10.00
E. M. F.....	30.....	15.00
American.....	30.....	20.00
American.....	34.....	21.00
American.....	56.....	22.00
Krit.....	All Mod.....	18.00
Nyberg.....	4-Cy.....	20.00
Nyberg.....	6-Cy.....	22.00
Westcott.....	6-Cy.....	20.00
Stoddard-Dayton.....	All Mod.....	20.00

## The M. & M. Company

500 Prospect Ave. Cleveland, Ohio  
Do You Want Our Big General Catalogue?  
It's Yours for the Asking.

# Save Money

On All Your

# Auto Supplies

In conjunction with our large automobile department we have an accessory department where we carry everything necessary for the automobile at

## PRICE WRECKING PRICES

To give you a clearer conception of the amount you save in doing business with us we have listed 3,000 bargains in our

## PRICE WRECKER No. 40

Write for it at once. It's free and a "Big Money Saver."

## Times Square Auto Company

**NEW YORK** | **CHICAGO**  
S. W. Cor. | 1210-1212  
Broadway & 56th St. | Michigan Ave.

## TOOL KITS

Special Sale of Complete Tool Kits  
Why pay \$5.00 when you can get a standard kit complete for \$1.09?

**PURITAN MACHINE CO.**  
Detroit, Mich.

**ALL PARTS** | **ALL CARS**

**VULCANIZER, SLIGHTLY USED**  
AS GOOD AS NEW. FOR SHOP USE.  
A GREAT BARGAIN.

Vanderpool's, Springfield, Ohio

We Make Ford Racing Type Bodies

In several models for immediate delivery  
**AUTO SHEET METAL WORKS**  
1532 Michigan Ave. Chicago, Ill.



# The Clearing House—continued

## We Tear 'Em Up and Sell the Pieces

We want old autos, condition no object. We will buy anything for the auto. We have all kinds of parts, many of them new, are at unheard of low prices. Tires and tubes, many new, others used. Kingstons carburetors, all sizes; will exchange for others. Gears of all kinds, new gas oval tanks, new timers, magnetos, coil, Stewart speedometers, shafts and chains, tire covers, dust hoods, electric horns, new brass bumpers, lamps, all kinds; Prest-O-Lite tanks, rollers, cylinders, pistons, transmissions, crankshafts, seats and bodies; new 30x3½ wheels, many other used sizes; rims; several chassis without engines; 2-cylinder, 4-cylinder, 6-cylinder engines; springs; in fact, everything that an auto needs. Correspondence solicited. If we do not have it, will advise you where you can get it. FOLLOWING MOTORS NOW IN STOCK PRICED FOR QUICK SALE:

4-cyl. Jackson engine, model 38.....	\$100.00
4-cyl. Stevens-Duryea engine, model R, 24 h.p. ....	90.00
4-cyl. Ford engine, model B, 20 h.p. ....	50.00
4-cyl. King 1013 engine, 30 h.p. ....	100.00
4-cyl. Pope Toledo engine, 50 h.p. ....	75.00
2-cyl. Rambler engine, 20 h.p. ....	30.00
4-cyl. model N Ford engine, complete, 15 h.p. ....	50.00

Can furnish any ignition system for motors at small additional figure.

Will sell any part of these or other motors. New fresh stock storage batt.

OUR GUARANTEE TO ALL—IF NOT SATISFIED WITH YOUR BARGAIN, RETURN AND WE WILL REFUND YOUR MONEY.

### AUTO WRECKING CO.

Old Church, 13th and Oak  
KANSAS CITY, MO.

Will pay cash for your Prest-O-Light Tanks

E. B. COLLINS

Danville Illinois

### YOU CAN CHANGE YOUR CAR

into raceabout yourself. We furnish radiators, hoods, seats, tanks and fenders. Get our prices.

AUTO SHEET METAL WORKS  
1532 S. Michigan Ave. Chicago, Ill.

### 10,000 Miles Without Punctures

10,000 miles without punctures or slow leaks, and doubled mileage. Porous tubes repaired in five minutes with "Sin-Ti" Puncture Fluid, the practical puncture eliminator. All at small cost of 50c per 3 or 3½ inch tube, 75c per 4 or 4½, \$1 per 5 or 5½. Satisfaction or money back. Literature upon request.

SIN-TI TIRE CO., Washington, D. C.

50 CENTS KEEPS YOUR CAR BRIGHT for a whole season. By using That Mysterious Rag Duster. Can't be beat. Polishes auto bodies, lamps, windshields, etc. Satisfaction guaranteed or money refunded. GEM SUPPLY CO., 1036 S. Main St., Waterbury, Conn.

## PARTS AND ACCESSORIES WANTED

WE WANT AUTO ACCESSORY ACCOUNTS. What have you to sell or put on the market? Fully equipped service station.

SACKETT & TRUMBULL, Mfrs. Agents  
325 E. 21st Street Chicago, Ill.

## PATENTS & PATENT ATTORNEYS

### C. L. Parker, Patent Attorney

Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C. Pamphlet of instruction sent upon request.

### PROTECT YOUR IDEAS

Send for free book and free search plan.  
MILO B. STEVENS & CO.  
53 W. Jackson Blvd., Chicago  
Established 1864 Main office, Washington

## RADIATOR AND LAMP REPAIRING

### A. A. A. Radiators Manufactured

Any make repaired and returned same day. Radiator to fit any car shipped in 3 days.

SHEPPARD CO., 1331 Jackson Blvd., Chicago

A. A. A. WE REPAIR AUTO RADIATORS, Lamps, Fenders, Wind Shields, Tanks and Horns of all kinds. Bargains always on hand. Estimates given.

HUDSON AUTO LAMP WORKS, Inc.,  
1648-50 Broadway New York

### AMERICAN AUTO SHEET METAL WORKS

We are masters of the trade. Manufacturers of Radiators, Hoods, Fenders, Gas Tanks, etc. Repairing a specialty.

1446 Wabash Ave., Chicago, Ill.

## CHICAGO MFG. CO.

1466 Michigan Avenue, Chicago

We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

### DULUTH AUTO RADIATOR AND LAMP REPAIR WORKS

We repair burnt, frozen and wrecked radiators; also auto fenders; hoods and tanks made to order. Shipments promptly taken care of.

336 E. Superior Street Duluth, Minn.

## Largest Radiator Factory in the West

Selling radiators of the highest quality at very reasonable prices. Radiator repairing and installing new cores in old or damaged radiators given our prompt and careful attention. Hoods, fenders and tanks. All work guaranteed.

ILLINOIS AUTO SHEET METAL WORKS  
58-60 E. 16th Street Chicago, Illinois

## ONLY RADIATOR FACTORY IN NORTHWEST

Pioneer manufacturer. Why send your radiator down east when you can ship it to us; save time, express, freight, money, and get best workmanship. Prices right. Make new radiators, allow for old one.

TODD MANUFACTURING CO.  
820-824 Mary Pl. Minneapolis, Minn.

## REBUILDING AND REPAIRING

### ANDRE G. CATELAIN

Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelain Hose Coupling.

1446-8 Indiana Avenue Chicago, Ill.

## CYLINDERS REBORED

Pistons and Leak Proof Rings Furnished

General overhauling, crankshafts manufactured. Quality Guaranteed. Prices interesting.

### HOPE MACHINE CO.

2nd & Dauphin Sts. Philadelphia, Pa.

## A NEW MOTOR

made out of your old one; we will rebores and grind your cylinders and make new pistons and new rings, the whole operation to be up-to-date factory methods. Write or 'phone for prices on your car.

Full line of De Tangle parts in stock

STARBUCK AUTOMOBILE CO.

Baltimore Ave. and Fernwood, Rebores Dept. Philadelphia, Pa.

### CYLINDER REBORED

Including piston and rings.....\$7 to \$11  
STERLING ENGINE CO.  
331 So. Clinton Street Chicago, Ill.

## CYLINDERS REBORED AND REGROUND

Fitted With My Light Cast Iron Pistons

40% to 100% lighter than standard, and with my new rings, makes a four run like a six, with a guaranteed gain in efficiency of from 25% to 50%.

McCADDEN MACHINE WORKS  
ST. CLOUD, MINN.

## CYLINDERS REGROUND

and fitted with new pistons and rings for \$7 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices.

Oxy-acetylene welding done at reasonable prices

### CROWN MACHINE SHOP

Crown Point, Ind.

## MR. MOTORIST

If you take particular pride in the operation of your motor, and you certainly should, YOU should investigate the claims I make for my extra light pistons and connecting rods and my special design piston rings. All these parts being designed with the special idea of increasing the efficiency and decreasing the noise and vibration of your motor.

### CYLINDERS REGROUND ABSOLUTELY ACCURATELY

### Lee W. Oldfield

MINNEAPOLIS MINNESOTA

## STOP THAT KNOCK

LET US EQUIP YOUR ENGINE WITH

## OVERSIZE

Hardened and Ground Wrist Pins

Cylinder Grinding Crank Shafts Straightened

### ADAPT MACHINERY CO.

1624 So. Wabash Ave. Chicago, Ill.

### WE REGRIND CYLINDERS

Furnish our heat treated piston rings and pistons. First-class equipment, 15 years' experience. Write for our prices.

### BRIDGEPORT PISTON RING CO.

Bridgeport, Conn.

## SCHOOLS

## FREE BOOKLET

"How to Succeed in the Automobile Business," on application. A Greer diploma guarantees efficiency. Largest motor college in the world—1,400 graduates—\$40,000 in modern equipment—eight instructors—actual work, repairing and driving—Day and evening classes—many owners and dealers employ Greer graduates only.

### GREER COLLEGE OF MOTORING

Chicago's "Safety First" Automobile School  
1456 Wabash Ave. Chicago

## LEARN REPAIRING

On every make, driving on dozens of cars, starting and lighting with largest equipment in America; steam vulcanizing, oxy-acetylene welding and everything known to this business. A \$20 to \$50 course brings you \$1,000 to \$2,500 a year.

Academy of Automobile Engineering  
1452-54 Michigan Ave., Chicago, Ill.

# The Clearing House—continued

**THE AUTOMOBILE BUSINESS OFFERS** wonderful opportunities. We are placing men from all parts of the country in good paying positions. Send for Booklet "M."  
**STEWART AUTO SCHOOL**  
 Chartered by N. Y. State Board of Regents  
 225 W. 57th Street New York City

## STORAGE AND SHIPPING

**P. BRADY & SON CO.**  
 Trucking and Storage, Automobiles and Bodies  
 Stored. Automobiles boxed for Export.  
 552-558 W. 58th Street, New York  
 Telephone 3440 Columbus

## TIRES

### TIRE REDUCTIONS!!

These tires are all of heavy car type of a well known manufacture. They are slightly blemished and average 5,000 miles service. 30x3. \$6.75; 30x3½, \$8.50; 32x3½, \$8.80; 33x4, \$12.40; 34x4, \$12.50; 36x4, \$13.75. All other sizes. Non-skids, 10 per cent higher.

### TIRE SALES CO.

931 Main St. Buffalo, N. Y.

### BARGAINS—TIRES—BARGAINS

In Guaranteed, Seconds and Used Tires  
 Write for our prices

**ACME TIRE REPAIR COMPANY**  
 1547 Michigan Ave. Chicago, Ill.

## Make Two Old Tires

do the work of a new one. Send us two of your old casings, regardless of their condition; by our process we return you the two tires made into one ready for 2000 miles of actual service. We guarantee this mileage absolutely. We are doing it for others. Send us two old tires today, or write and ASK US HOW.

## COWANS BROS.

150 W. 55th St. New York City

### TIRES! TIRES!

#### ALL FRESH SELECTED SECONDS

80x3	7.00	34x4	14.75
80x3½	9.25	35x4½	19.50
82x3½	9.75	36x4½	19.75
88x4	14.35	37x5	23.75

All other sizes in stock. Non-skids, 10% extra. All orders C. O. D. on approval.

**GUARANTEE TIRE & RUBBER COMPANY**  
 1111 Hennepin Ave., Minneapolis, Minn.  
 234 N. Broad St., Philadelphia, Pa.

### TIRES

34x3½ Cl. or Q. D. Clincher, first grade, \$8.50 each. 36x5 Clincher or Q. D. Clincher, first grade, \$18.50 each.

**THE TIRE SHOP, 88 Biddle St., Milwaukee, Wis.**

## 800 TIRES—ANY SIZE

#### NEW, FRESH STOCK—BEST MAKES

28x3	6.90	30x4	13.75
30x3	7.60	34x4	15.50
32x3	8.20	32x4½	16.00
30x3½	10.50	34x4½	19.50
32x3½	10.90	36x5	23.90

Other sizes in proportion. Special prices to dealers in lots of 25 tires or more.

### SERLIN TIRE COMPANY

1073 14th Place Chicago, Ill.

## WANTED—AGENTS & SALESMEN

**EXCLUSIVE AGENTS WANTED IN UNALLOTTED TERRITORY**  
 A very small investment will make you our exclusive sales agent in your territory for the world's quickest wrench. It is the Cochran "Speednut" Wrench, which automatically and instantaneously takes a lightning grip on any nut from ¼" to ¾". One man in two weeks cleared over \$750.00. You can sell to eight out of every ten prospects.  
**HENES SALES CORPORATION**  
 179 W. Washington St. Chicago, Ill.

### Men With Patentable Ideas

Write **RANDOLPH & CO.,**

Patent Solicitors

Dept. 331, Washington, D. C.

## Opportunities for Live, Responsible Individuals or Firms

to Make Money Selling **GASOLETTE.**  
 Choice territory open.

Dealers who sell Gasolette sell a highly serviceable product, and incidentally make a lot of money.

Gasolette users buy it as regularly as they buy oil and fuel. When you make a Gasolette customer you keep him.

Gasolette poured into gasoline increases mileage from 40 to 60 per cent. Guaranteed to contain no ingredient injurious to motors. Gives motors greater power, more speed and 100 per cent flexibility. Prevents pre-ignition, pounding and overheating of engine. Guaranteed to remove and prevent carbon deposits.  
**Quart Can (Will Treat 64 Gal. Gasoline), \$1.35**  
 Sent prepaid upon receipt of price.

Write for our unique co-operative sales proposition.

### UNITED PRODUCTS MFG. CO.

Dept. M, 219 E. 22d St. Chicago, Ill.

**SALESMAN—To sell guaranteed automobile tires and tubes upon a profitable and attractive plan. Representatives throughout the states of Illinois, Indiana and Iowa wanted.**

**PAROK TIRE CO., 451 Rush St., Chicago, Ill.**

**WANTED—HIGH CLASS SIDE LINE SALESMAN** covering the garage trade of the United States. Best proposition in America. Write us. **W. & L., 765 West North St., Kalamazoo, Mich.**

## WANTED BY ONE OF THE LARGEST RETAIL AUTOMOBILE HOUSES IN CALIFORNIA

A high grade salesman thoroughly conversant with electric pleasure cars, who has had experience with retail trade and can furnish best possible references. A permanent connection is desired.

Address Box E-228, Care Motor Age

## WELDING

### AAI WELDING OF ALL METALS

Cast iron and aluminum a specialty.  
**ADVANCE WELDING MACHINE COMPANY**  
 525 W. Jackson Blvd. 111 N. Desplaines St.  
 Phones: Monroe 3937; Auto. 36-192. Chicago, Ill.

### Absolutely Guaranteed Welding

We absolutely guarantee all work done by the **OXWELD PROCESS** of welding and cutting. Including welding cracked or defective cylinders, crankshafts, housings, aluminum crank and transmission cases, etc., etc. Estimates furnished on job and contract welding and cutting of all kinds.

**OXWELD ACETYLENE COMPANY**  
 36th St. and Jasper Pl., Chicago, Ill.

### AMERICAN WELDING CO.

2637 Michigan Ave., Chicago  
 Autogenous welding of all metals, such as crank cases, cylinders, etc. We positively guarantee all work. Tel. Calumet 8563.

### AUTOGENOUS WELDING!

Expert welders on automobile parts. Manufacturer of the Galbraith Welding Torches.  
**C. SORESENSEN**

18 E. Sixteenth St. Chicago

Almost any metal broken you can have made good as new by a

### "VULCAN"

Oxy-Acetylene Welding and Cutting Plant. Not the cheapest, but most efficient known. Highest grade apparatus with special patterned features.

**\$100.00 and Upwards**

Write today for book "A" on welding

**VULCAN PROCESS COMPANY**  
 Minneapolis, Minn. Cincinnati, Ohio

### OXY-ACETYLENE WELDING

Broken automobile crankshafts, aluminum cases, cracked cylinders and general machinery parts successfully welded by us. Estimates cheerfully given. Satisfaction guaranteed.

**PIONEER WELDING CO.**  
 610 E. Main Street Kalamazoo, Mich.

### WELDING

Cylinder, crankcase and crankshaft welded. Cylinders rebored, \$7 to \$11 a cylinder, including pistons, 8 rings.

**STERLING ENGINE COMPANY**  
 331-333 S. Clinton Street Chicago, Ill.

## MISCELLANEOUS

### BEAUTIFUL CHRISTMAS KODAK ENLARGEMENTS

8x10 mounted 25c. Send only the negative. **KODAK FINISHING—50c OFFER FOR 10c** Send 10c (stamps) and roll of film, any size, 6 or 12 exposure; will develop film and also make 6 pictures from best negatives. Beautiful work. Prompt service.

### ROANOKE CYCLE COMPANY

Roanoke, Va.

### We Are Constantly in Touch

with employers requiring High-Grade Engineering service. Are you listed with the **TOLEDO ENGINEERING AGENCY**  
 Toledo, Ohio

## Trading Time in Motordom

### For Parts and Accessories

The next three months offer an excellent opportunity to dispose of parts and accessories to advantage.

There is a good demand **NOW.**

Why not spend a small amount and dispose of your parts and accessories at once?

**MOTOR AGE CLEARING HOUSE** columns offer golden opportunities for disposing of all kinds of parts and accessories.

Note advertisements in preceding pages.

For further particulars address **MOTOR AGE, 900 S. Mich. Ave.**  
 Chicago, Ill.



# Classified Advertising

Rate 25¢ a Line

## Cars For Sale

**BIG BARGAIN—ONE 1911 MODEL T FORD** touring car, fore doors, electric lights, master vibrator, tools, etc. Good running order. \$195.00 cash. Ed. L. Six, Ashland, Ill.

**FOR SALE—BRAND NEW 1914 FIVE PASSENGER** Cadillac automobile, complete with extra casing, tube, cover, chains, fender, etc. Price \$1,400. Address "Harry," 315 Fourth Ave., Clinton, Iowa.

**FOR SALE—FIVE USED AUTOS. CHEAP** for cash; 2 E-M-F touring; 1 Regal underslung touring; 1 60 H. P. Thomas; 1 racing car. W. F. Sinclair, Montpelier, Ind.

**FOR SALE—NEW SIX-CYLINDER CHALMERS** car, 1914 model; has been driven but a few hundred miles; equipped with Kellogg pump, chains, extra shoe and clock; in perfect condition; price reasonable; can be seen at 1417 Fairfield avenue, Bridgeport, Conn. Telephone 602.

**FOR SALE—POWERFUL MERCEDES REBUILT** into a racy roadster, double chain drive, four speeds. Six hundred fifty cash takes it. T. R. Smith, care Commercial Auto Co., Lexington, Ky.

**FOR SALE—STANDARD ELECTRIC Coupe; Model M; in first class condition.** Gray Whipcord interior. Address F. R. Hall, Marietta, Ohio.

**FOR SALE—1914 WINTON; COMPLETELY** equipped. Condition guaranteed. \$1,850 F. O. B. cars. No trade. Theo. D. Abeles, Little Rock, Ark.

**FOR SALE—50 H. P. ELMORE ENGINE,** latest model, rotary distributor, with silent chain drive, in first class condition. Run less than one thousand miles. Price if taken quick, \$75.00. Address A. B. C., care Motor Age.

**\$375 BUYS A NEW SAXON CAR; RUN** very little, reason for selling, want a 5-passenger car; a bargain. Theo C. Becke, Carleton Neb.

## Cars Wanted

**\$700.00 EQUITY—160 ACRES OF GOOD** land five miles from county seat and on railroad now being constructed. Will take a second hand automobile in good running order for my equity, subject to a mortgage for \$900 due in two years at 6 per cent. Write to Fred A. Winger, Grand Marais, Minn.

**WILL SELL OR TRADE FOR LIGHT FIVE-PASSENGER** auto 1914 model 1 or 2 lots in Quogue, Suffolk County, Long Island, N. Y. R. H. Smith, Katy Hotel, Houston, Tex.

**WANTED—PACKARD "38" OR "48" TOURING** car, must have electric starter and lights, in exchange for 150 acres joining the town of Stratton, Kit Carson County, Colo. (main line Rock Island to Denver) good land and can all be farmed. Price \$25 per acre; mortgage of \$500. Want car for equity. Hall Land Co., Lincoln, Neb.

**WANTED—TO EXCHANGE 7 ROOM UNFURNISHED** cottage, located southern winter resort for 1914 7 passenger six cylinder touring car. Mrs. M. E. Wirt, Chestnut Hill, North Bend, Catonsville, Md.

## Parts and Accessories FOR SALE

**FOR SALE—ONE NEW TWO-CYLINDER,** 9-12 horse power Mack cyclocar engine. One pair friction drive transmission. One I beam front axle complete. Shunk Plow Co., Bucyrus, Ohio.

**FOR SALE—SMALL ELECTRIC LIGHT** outfit for car, boat or house. Perfect condition. Address Box E 215, care Motor Age.

**FOR SALE—TWO FRENCH RACING** seats, upholstered, \$6.50 each; one round gasoline tank, \$5.00. Photograph on request. Address Robert M. Roof, Anderson Fdy. & Mach. Co., Anderson, Ind.

**FOR SALE—1 No. 5 MOTORCYCLE SIZE** Prest-O-Lite Tank; price, \$6.00. 2 Air-Friction Carburetors, 1½ and 1 inch; price, \$4.00 and \$5.00. These are new. Ernest C. Bandle, Cambridge, Ill.

## Parts and Accessories WANTED

**WANTED—A THOMAS SURREY (TORPEDO)** Body, 1912 style, upholstered, second hand, cheap. Give description. Lock P. O. Box 822, Greenport, L. I., N. Y.

**WANTED—USED AKRON-WILLIAMS** vulcanizing outfit. Must be a bargain. Eugene Ballou, Arkansas City, Kansas.

## Help Wanted

**I WOULD LIKE TO HEAR FROM SOME** young men who would like to accompany me in an auto trip to the Exposition. Address Box 228 care Motor Age.

## Situations Wanted

**A MAN, COMPANION, FRIEND, AND** mechanic would like a position as companion and driver for a gentleman wishing to drive to the Panama-Pacific Exposition. I am a University graduate and very well read. Address Box 227 care Motor Age.

**COMPETENT CHAUFFEUR DESIRES** position, 8 years' experience, do all repairs, operate any car, strictly sober, married; would like year around position. Address Box E-188, care Motor Age.

**DESIRE POSITION AS TESTER OR RACING** mechanic with some Motor Car Company. Derl Kimler, Leroy, Illinois.

**SITUATION WANTED—FACTORY MANAGER** or Superintendent. Eighteen years' experience in all branches. Address Box E 221, care Motor Age.

**I WOULD LIKE TO HEAR FROM ANYONE** in the racing game and owning a racing car who desires the services of one who knows how to drive and take care of a car. A1 reference furnished. Address Box E, 226, care Motor Age.

## Business Opportunities

**FOR SALE AT A BARGAIN—GARAGE** with full equipment, including Bowser pump machinery, oil tanks, vulcanizer, Prest-O and Searchlight service. Located on Lincoln highway, where hundreds of tourists pass every day. Building can be leased for 5 years. Average gas sales 1,500 gal. per week. A bargain at \$2,500. Address Box E 170, c/o Motor Age.

**FOR SALE—MODERN GARAGE, WELL** equipped, on good paying basis, best location in county seat town in Wisconsin, 9,000 population; cheap rent, fireproof. Reasons for selling, requires \$1,000. Will sell half interest to good mechanic. Address Box E 223, care Motor Age.

**WANTED—TO INTEREST CAPITAL IN** new rotary valve motor, simple; piston and rod only reciprocating parts; patents granted and pending. Address "Rotary Valve," 510 W. 4th, Sedalia, Mo.

**WILL SELL OUTRIGHT OR ON ROYALTY,** clever device for valve retainers. Patent pending. Address W. B. Hoban, 419 Belden Ave., Chicago, Ill.

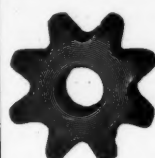
## Chicago Shock Absorbers for Ford Cars



Made of special steel. Simple and easy to apply. No holes to drill, no parts to remove but the shackles. Anyone can apply in 30 minutes. Made for either Touring Car or Runabout. When ordering state which. Special price to dealers. List price, complete set.....\$8.00

**CHICAGO AUTOMOBILE SUPPLY HOUSE**

1355 S. Michigan Avenue, Chicago, Illinois



**SPROCKETS**  
CHAINS AND DIFFERENTIAL  
IN STOCK OR ORDER

SEND FOR NEW CATALOG

**Cullman Wheel Co.,** 1341 Altgeld St. Chicago



Series Plugs

Used with regular plugs they ignite the mixture at two points at once. They give a wonderful increase in power with less fuel. Easily installed; suit any ignition system. At your dealer's or by mail.

**Superior Motor Specialty Co.**

46 N. Fourth Street

Philadelphia

## Hoyt Electrical Instrument Works

Makers of

**HOYT AMMETERS**  
**AND VOLTMETERS**

Penacook

New Hampshire

# WESTON Model 301 Ammeters for the Cowl or Dashboard



are specially built with a full knowledge of the exacting requirements of automobile service. They are designed for continuous reliability and like all other Weston Models, are constructed with the most conscientious regard for the service for which they are intended.

Their serviceability, accuracy, and durability is vastly superior to that of any other small instrument and, in fact, their merits are so radical as to place them in a class which is distinctly their own. We should be glad to prove these statements upon request.

There is no better insurance for the automobile, or starting and lighting equipment manufacturers, against dissatisfied owners or expensive claims, than to use Weston Model 301.

It is an extremely high grade yet surprisingly inexpensive instrument.

For information address,

**Weston Electrical Instrument Co., Newark, N. J.**

New York Boston San Francisco Atlanta Berlin and  
Chicago St. Louis Detroit Richmond London  
Philadelphia Denver Cleveland Toronto

You cannot run your car with any old air pressure in the tires and expect the tires to last.

Tires are built to withstand a definite and specified air pressure.

You can only get maximum service when you inflate them to the exact air pressure needed, and maintain that specific pressure at all times.

# SCHRADER



**ONE DOLLAR**  
invested in the purchase of a  
**SCHRADER UNIVERSAL  
TIRE PRESSURE GAUGE**  
will save you hundreds of  
dollars for new tires.

For Sale by Tire Mfgs., Jobbers, Dealers, Garages or

**A. SCHRADER'S SON, Inc.**

783-791 Atlantic Ave.

Brooklyn, N. Y.

# Index to the

Atwater Kent Mfg. Works..... 82  
Auto Parts Co..... 85

Bosch Magneto Co..... Cover  
Braender Rubber & Tire Co..... 83  
Brennan Motor Mfg. Co..... 83  
Bricton Mfg. Co..... 61  
Bridgeport Brass Co..... 86  
Briggs-Detroit Co..... 82  
Broderick and Bascom Rope Co..... 78  
Buda Co..... 74  
Byrne, Kingston & Co..... 86

Cartercar Co..... 83  
Champion Spark Plug Co..... 69 to 72  
Chicago Automobile Supply House..... 93  
Classified..... 93  
Clearing House..... 87 to 92  
Connecticut Telephone & Electric Co..... 80  
Continental Motor Mfg. Co..... 84  
Corbin-Brown Speedometer..... 95  
Corcoran Lamp Co..... 84  
Cullman Wheel Co..... 93

Dayton Rubber Mfg. Co..... 80  
Dodge Bros..... 73  
Dyneto Electric Co..... 84

Eisemann Magneto Co..... 81  
Electric Auto-Lite Co..... 82

Federal Rubber Mfg. Co..... 85  
Firestone Tire & Rubber Co..... 85  
Ford Motor Co..... 85

Gabriel Horn Mfg. Co..... 75  
Garford Mfg. Co..... 66  
Golden, Belknap & Swartz Co..... 81  
Gould Storage Battery Co..... 77  
Gray & Davis..... 4

Haywood Tire & Equipment Co..... 77  
Hazard, Henry T..... 84  
Heinze Electric Co..... 86  
Herz & Co..... 79  
Hess-Bright Mfg. Co..... 56  
Holley Bros. Co..... 82  
Houk, George W., Co..... 82  
Hoyt Electrical Instrument Works..... 93  
Hyatt Roller Bearing Co..... 81

Inter-State Motor Co..... 82

Jeffery-DeWitt Co..... 67

K-W Ignition Co..... 76  
Kanneberg Roofing & Ceiling Co..... 95  
Kimball Tire Case Co..... 86  
Kissel Motor Car Co..... 68

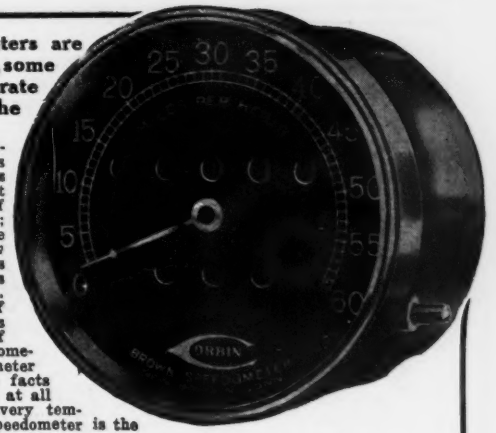


# Advertisements

Lexington-Howard Co.....	84
Lumen Bearing Co.....	2
Master Carburetor Corp.....	80
Maxwell Motor Co.....	51
Mercer Automobile Co.....	79
Metz Co.....	86
Moline Automobile Co.....	86
McQuay-Norris Mfg. Co.....	79
New Departure Mfg. Co.....	75
New York and New Jersey Lubricant Co....	80
Nordyke & Marmon Co.....	84
Northern Engineering Wks.....	85
Packard Motor Car Co.....	96
Paige-Detroit Motor Car Co.....	83
Peerless Motor Car Co.....	57 to 60
Pennsylvania Rubber Co.....	81
Poyer, D. F., Co.....	78
Premier Motor Mfg. Co.....	83
Prest-O-Lite Co.....	84
Rauch & Lang Carriage Co.....	Cover
Rayfield Carburetor.....	52
Republic Rubber Co.....	85
Robbins, Irvin, Co.....	81
Royal Equipment Co.....	62-63
Rutenber Motor Co.....	83
Salisbury Wheel and Mfg. Co.....	84
Schrader's Son, A.....	94
Scripps-Booth Co.....	1
Searchlight Co.....	80
Shaler, C. A., Co.....	85
Sheldon Axle Co.....	64-65
Sparks-Withington Co.....	49
Sphinx Motor Car Co.....	80
Splitdorf Electrical Co.....	81
Standard Oil Co.....	86
Star Ball Retainer Co.....	83
Stromberg Motor Devices Co.....	54-55
Superior Motor Specialty Co.....	93
Troy Wagon Works Co.....	78
Twitchell Gauge Co.....	85
Vulcan Mfg. Co.....	83
Warner Gear Co.....	76
Weston Electrical Instrument Co.....	94
Wheeler and Schebler.....	50
Whitney Mfg. Co.....	79
Wilkes & Grant Co.....	82
Willard Storage Battery Co.....	53
Willys-Overland Co.....	Back Cover
Winton Motor Car Co.....	80
Wisconsin Motor Mfg. Co.....	86
Zenith Carburetor Co.....	74

Some speedometers are obviously wrong, some are nearly accurate and some tell the actual truth.

When an automobilist knows his speedometer is wrong he at least can make use of that knowledge; however, when he does not know whether its record is wrong or not he is hopelessly at sea. But neither one of these speedometers is worth the price of scrap iron. A speedometer to be a speedometer should tell positive facts day in and day out, at all altitudes, and in every temperature. Such a speedometer is the



## CORBIN-BROWN SPEEDOMETER

"The Speedometer of Absolute Accuracy"

The Corbin-Brown possesses the one absolute essential to accuracy which almost every other speedometer lacks—the centrifugal principle. A speedometer to be continually accurate at all degrees of heat and cold, at high altitudes, and in the presence of electrical influences must be built on the Centrifugal principle.

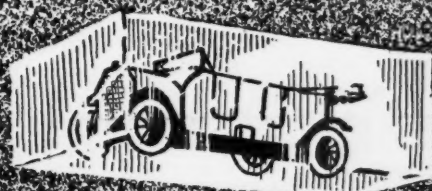
Not only has the truth of this statement been proven time and time again by scientific experiments conducted in government laboratories, but actual practical road tests have demonstrated it to be undeniably correct.

The Corbin-Brown's Construction is the perfection of simplicity—so few, large and strong are its parts

Specify this speedometer for your 1915 equipment. Its principle spells accuracy; its construction durability. Investigate today. Write now for catalog.

**The Corbin Screw Corporation, New Britain, Conn.**  
THE AMERICAN HARDWARE CORPORATION, Successors  
BRANCHES: New York Chicago Philadelphia

Makers of Corbin Brakes and Automatic Screw Machine Parts



## Is Your Car in Cold Storage?

Might just as well have it frozen in a solid cake of ice as leave it in a cold, damp, unheated garage all winter. Why not eliminate this enormous cold-storage depreciation? Why not investigate

### THE AUTO-HOT Home Garage Heater

and find out how hundreds of motor car owners have done away with the expense and annoyance of frozen radiators, cracked water jackets and starting troubles. Burns either natural or artificial gas and costs but a few cents each day to operate. Write for our booklet, "Winterizing the Motor Car," and read how every element of danger of fire or explosion has been removed in the Auto Hot Construction.

**The Kanneberg Roofing & Ceiling Co.**  
No. 112 Ninth St., S. E. Canton, Ohio

For sale by gas companies in artificial gas cities and by plumbers, stove dealers and automobile supply dealers in natural gas cities.



# Packard

MADE IN  
AMERICA

Many American buyers of foreign cars have been influenced largely by habit. But invariably their first purchase of a Packard has shown them the superior worth of the American-made car. In large proportion, they have been converted because they have realized in the Packard an expression of their own thought and taste, coupled with the superlative quality in performance on the road.

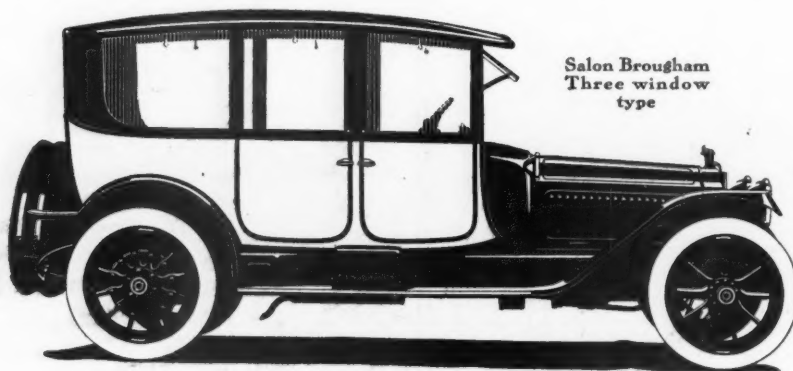
Packard maximum service qualities are embodied also in Packard trucks.

*Ask the man who owns one*

PACKARD MOTOR CAR COMPANY  
DETROIT

Lincoln Highway Contributor

Licensed Under Kardo Patents





# Bosch



## Confidence in Quality Products

What is the reputation of the ignition system on your motor car? Getting your money's worth means more than getting one hundred cents intrinsic value for every dollar expended—it means satisfactory service from the product bought, service on which you can depend whether the test or work is severe or ordinary.

### The Bosch Magneto

is the quality system. That fact has long been established, not by any one individual opinion, but by nearly two million users who use the Bosch Magneto and know!

Don't accept "magneto" or "high tension" as an ignition specification; insist that it read Bosch Magneto, and then look for the name on your motor car's magneto.

**Be Satisfied**

**Specify Bosch**

*Correspondence Invited*

### **Bosch Magneto Company**

**214 West 46th Street, New York**

**Chicago  
Detroit**

*Over 250 Service  
Stations ready  
to serve you*

**San Francisco  
Toronto**

Mable